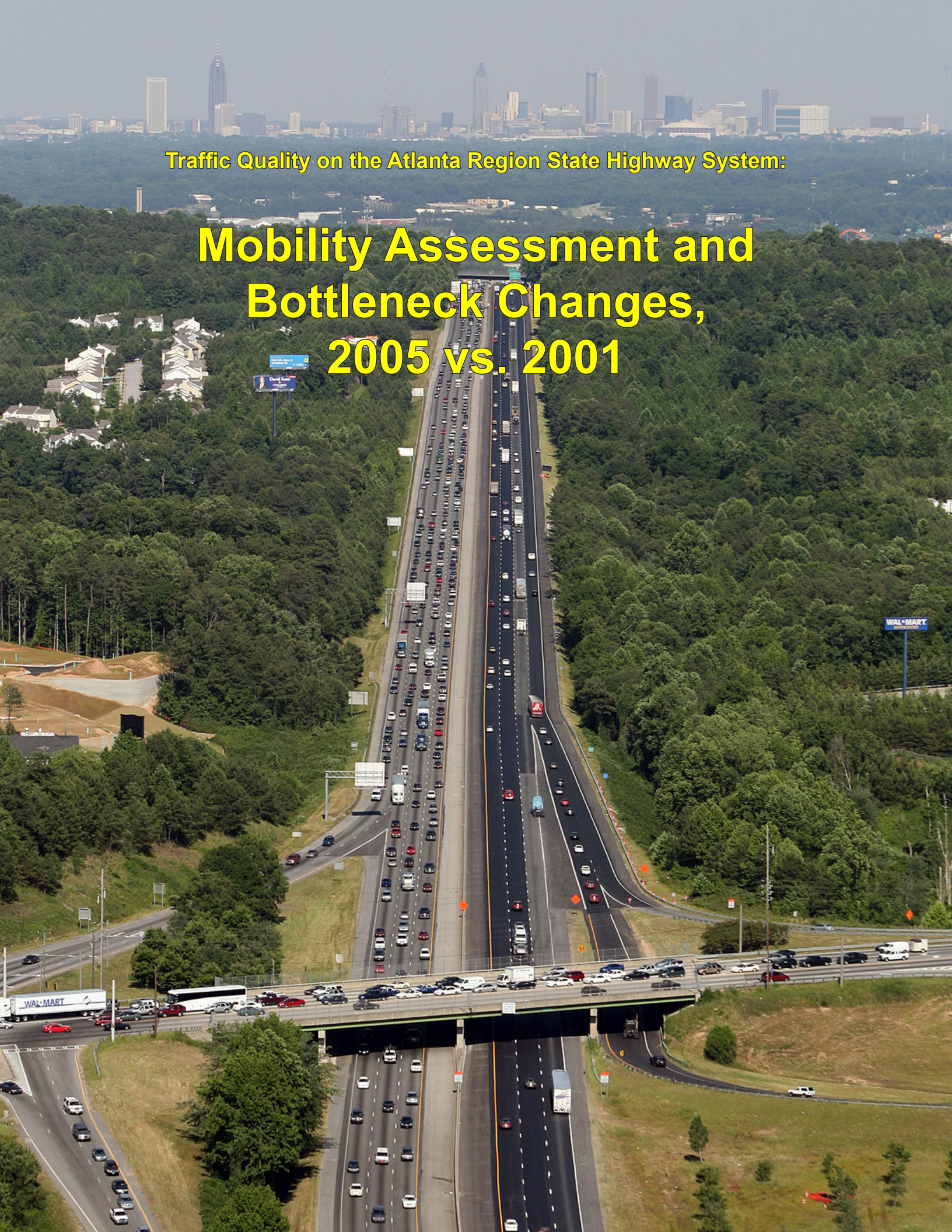
Traffic Quality on the Atlanta Region State Highway System:

Mobility Assessment and Bottleneck Changes, 2005 vs. 2001



Traffic Quality on the Atlanta Region State Highway System:

Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

Prepared for the

Georgia Department of Transportation

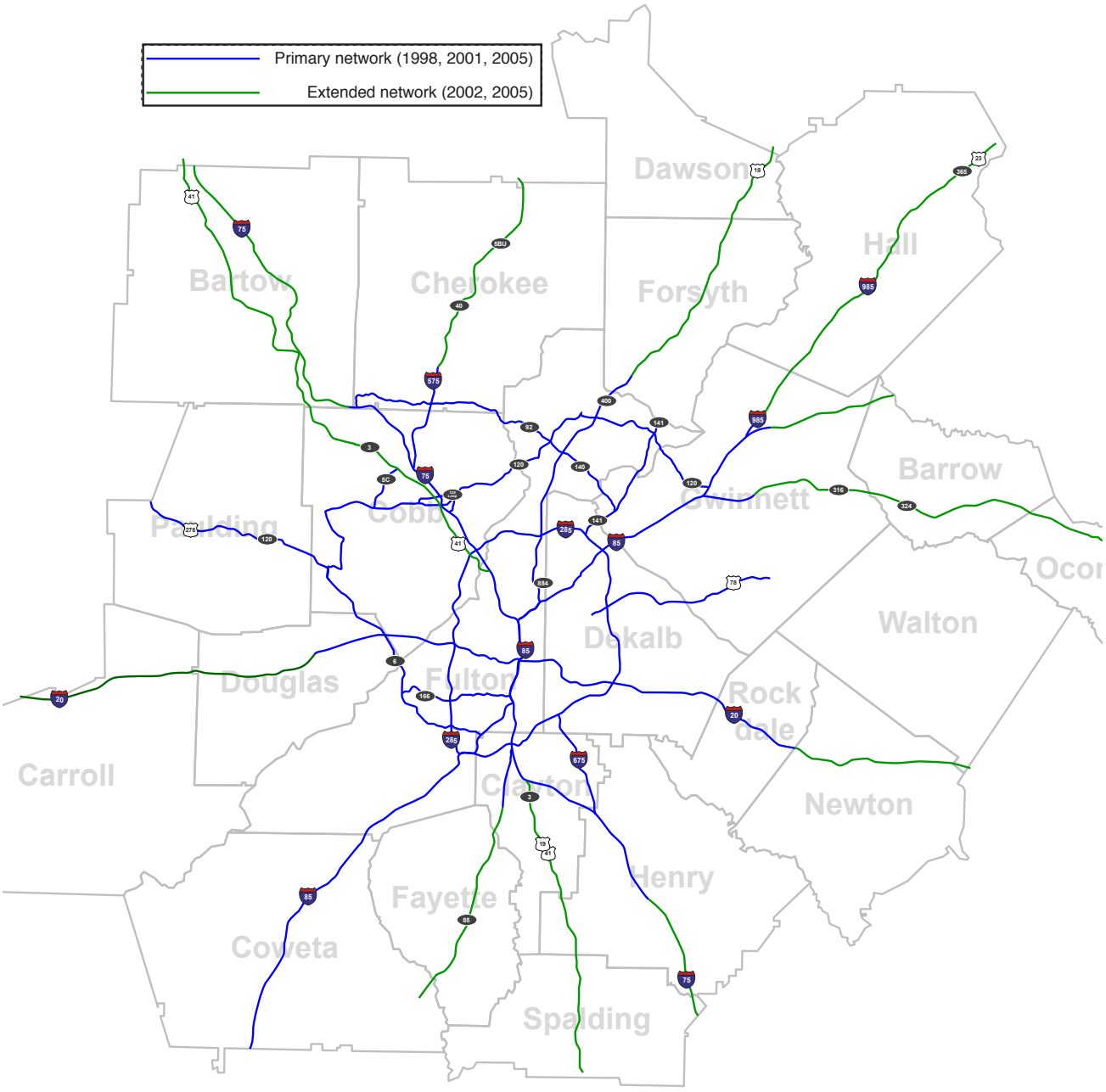
by Skycomp, Inc, Columbia, Maryland

***Abstract**: This publication summarizes the location and extent of daily recurring congestion on the state highway system in the 22-county Atlanta-centered planning region, as measured during morning and evening aerial photo-surveys. It also presents the locations where the most significant changes were recorded on the system between 2001 and 2005.*

CONTENTS

Cover: I-20 looking east at Thornton Road, 5:14 p.m. on May 24, 2006

EXTENDED PRIMARY NETWORK (2005 SURVEY)



ABOVE: This map shows the original "primary" network of highways that was surveyed in 1998 and 2001 (colored blue); this network was comprised of the freeway system plus selected key signalized arterial routes. The highways in the primary network were extended to the outlying counties in 2002, when a survey of just those extensions was conducted (colored green). This extended primary system was next surveyed in its entirety (blue plus green) in 2005.

In 2004, a second, larger network was defined, the "regional arterial network", comprised of the key signalized arterial state routes not already part of the primary network. This network (colored red) is shown on page 3.

Program background

Since 1998, the Georgia Department of Transportation has measured the flow of highway traffic across the 22-county Atlanta state highway network, through the use of aerial photo-density surveys. Link-by-link performance rating database tables have been generated for ordinary morning and evening peak commuter periods. These ratings indicate where highway usage is light, moderate, or heavy, and provide the location, severity and duration of congestion. This information is needed to support the project planning and funding cycle; that is, to insure that current conditions are understood with clarity, and so educated projections can be made about future conditions. This program also provides a means to evaluate the effectiveness of specific completed projects, where those investments were intended to maintain or restore highway mobility.

Data capture is through the use of time-lapse aerial photography, repeated every 2-4 years, during three-hour morning and evening commuter periods. Aerial photography permits the comparison of mobility & congestion levels across the entire region using uniform procedures. It also gives insight to the underlying causes of problems, while providing aerial photographs of each bottleneck that can help decision-makers better understand the technical findings.

The database now contains seven years of mobility performance ratings in the Atlanta-centered region. During that period, methods have been devised to store survey data and images in ways that facilitate fast and easy retrieval. Now, through the GDOT website, users can download the entire series of reports, extract performance rating tables from the underlying database, generate customized comparison graphics, and view interactive maps that not only depict and describe every bottleneck in the inventory, but also permit point-and-click access to each underlying aerial photograph. This collection of materials can be used for the full range of mobility assessment planning activities, from gaining a general understanding of the nature of congestion in different parts of the region, to focusing on specific bottlenecks of interest, and using the digital photos and graphics to create carefully targeted presentations or reports.

Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

The purpose of this analysis is to examine the survey findings covering the various highway networks that have been surveyed since 1998, and to report the following characteristics of regional mobility and congestion:

1. Where are the major, recurring bottlenecks on the state network? Which are most severe?
2. Where and to what degree has congestion been spreading on the state network?
3. Where has mobility improved on the surveyed network, and to what degree is it possible to associate those improvements with completed projects?

Accordingly, Part One provides an inventory of system-wide bottlenecks, as documented during the 2004 and

2005 survey flights. It includes a model-based ranking of the significant freeway bottlenecks. Part Two provides macro-level data summaries that confirm that mobility on the macro level has eroded measurably on the surveyed network during the seven-year life of the survey program. It also shows how that erosion is an average comprised of specific bottleneck sites that measured greater congestion with each survey iteration, offset to a large degree by sites where congestion was less severe. Specific examples of links on the system where both improvements and degradations were found are presented.

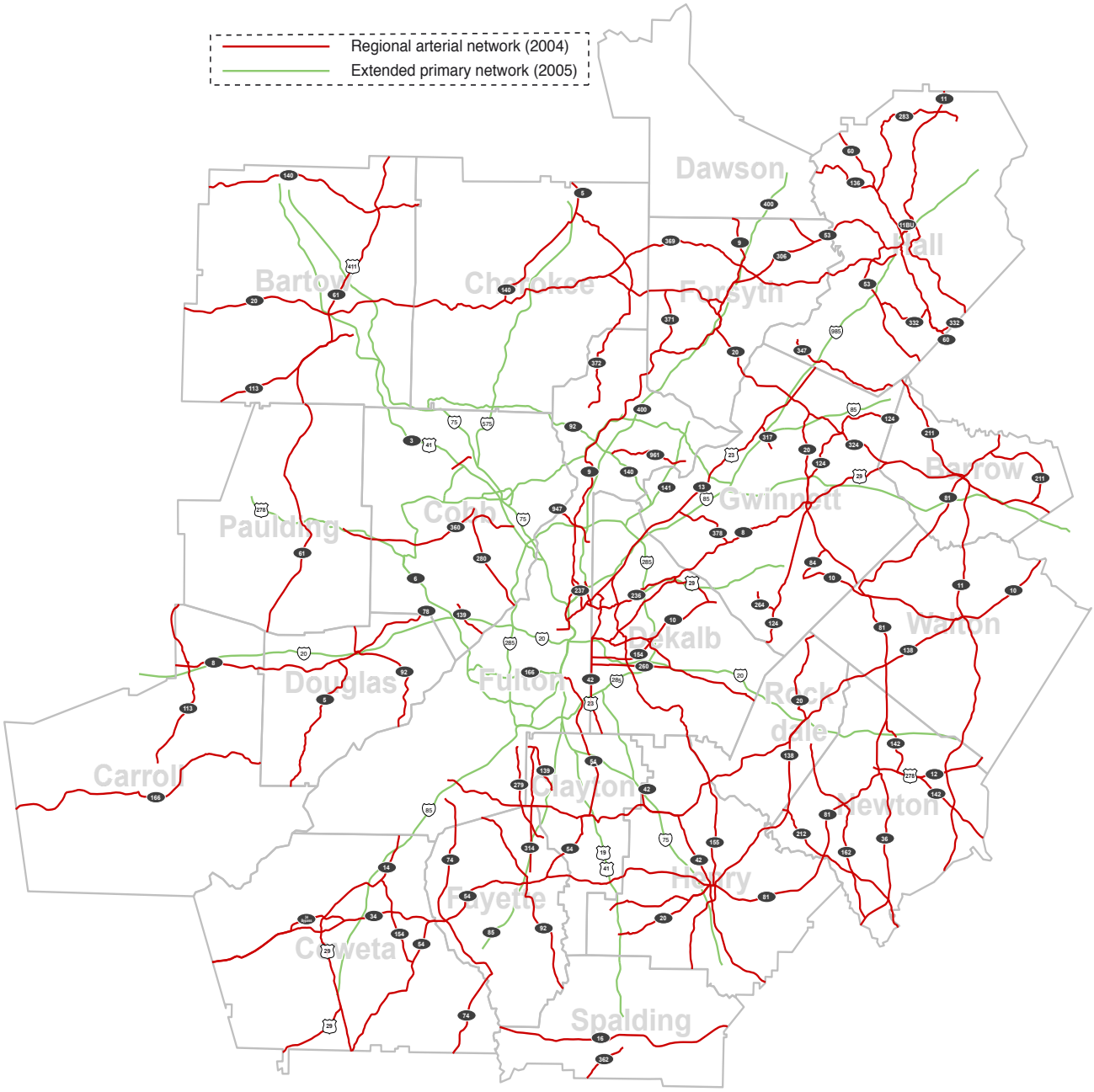
Appendix A itemizes the web-based tools generated by this survey program: interactive maps to find and download bottleneck aerial photography; the data extraction module; and links to download reports.

Questions

This survey program and all associated reports were conducted or generated by Skycomp, Inc. If there are any questions about this analysis or the underlying survey program, please contact Skycomp at 410-884-6900.

RIGHT: The Chattahoochee River forms an obstacle that generates extended queues during morning and evening peak travel periods. This photo shows approach congestion that varied widely from day to day, on northbound Holcomb Bridge Road in Norcross, through the signal at Spalding Drive.

REGIONAL ARTERIAL NETWORK (2004 SURVEY)



ABOVE: This map shows the second largest "regional arterial network". This network was defined and first surveyed in 2004. The regional arterial network was comprised of the key signalized arterial state routes not already part of the primary network (see blue and green colored highways on page I.)

Note: Part Two of this report compares 2005 with 2001/02, as there is not yet a later survey to compare to 2004.

Morning inbound congestion on I-85 at the Steve Reynolds Blvd interchange in Gwinnett County

PART ONE
Regionwide Mobility Assessment and Bottleneck Inventory

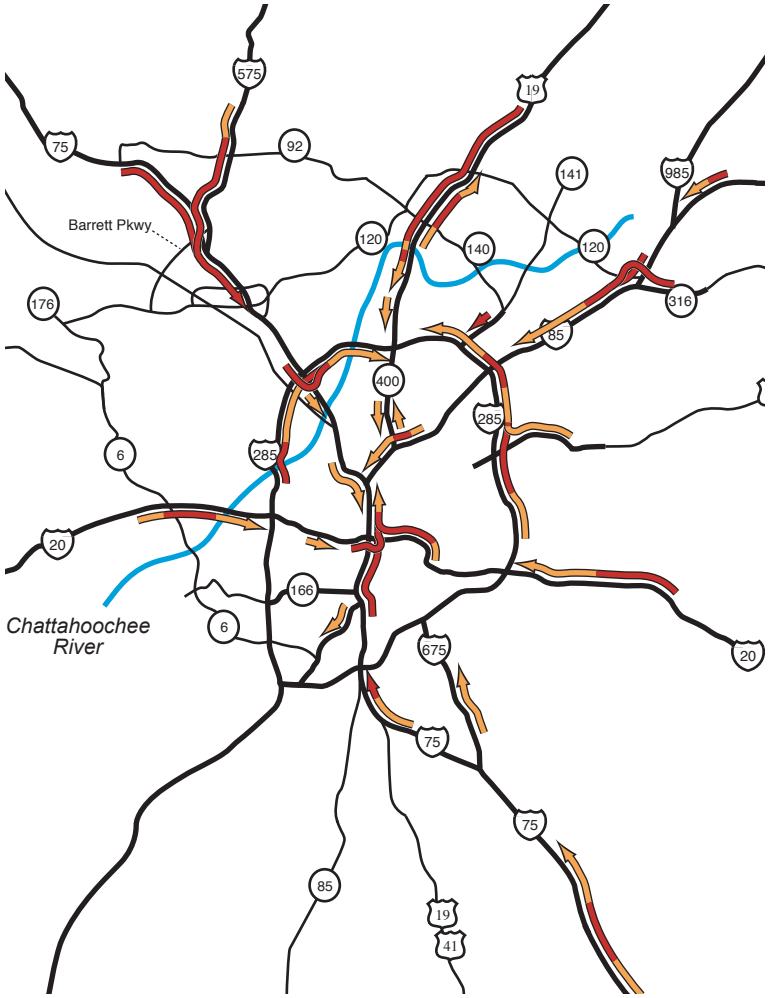
This section of the report discusses the general nature of congestion on the metropolitan-Atlanta area highway network. It also provides an inventory of the region's congested bottlenecks, both freeways and signalized arterials, as derived from 2004 and 2005 survey data. Average delays through the congested freeway zones have been estimated using a density-based speed model; each bottleneck has been ranked in severity based on this model. The most severely-congested signalized arterial corridors are also identified.

Qualitative observations about regional Atlanta congestion

Significant highway traffic congestion in the 22-county Atlanta planning region usually follows the general flow of inbound traffic (toward Atlanta) during the morning commuter period, and outbound flow during the evening period. The primary migration routes are the interstate highways and state arterials aligned with such radial movements: I-75 and I-575 to the northwest; SR 400 and I-85 to the northeast; US 78 and I-20 to the east; I-75, US 19/41, SR 85 and I-85 to the south; and I-20 to the west. Not all congested corridors are radial in nature, however. There are major suburb-to-suburb movements that generate congestion, following a circumferential rather than radial pattern. While much of this movement is centered on I-285, other major circumferential corridors include SR 92, SR 120 and SR 20 to the north; SR 20 and SR 124 to the east; SR 138 and SR 920 to the south; and SR 6 and SR 92 to the west.

An important reality in the generation of congestion in this region is that many commuters reside to the north and west of the Chattahoochee River, while many primary work centers are situated south and east of the river. The primary high-volume corridors toward or across this obstacle – I-75 and SR 400 – generate the greatest delays in the region. In fact, many of the circumferential

CONGESTED FREEWAY ZONES / MORNING 2005



Above: Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent congestion. (Interrupted-flow arterial routes are shown for orientation only; arterial bottlenecks are not shown.)

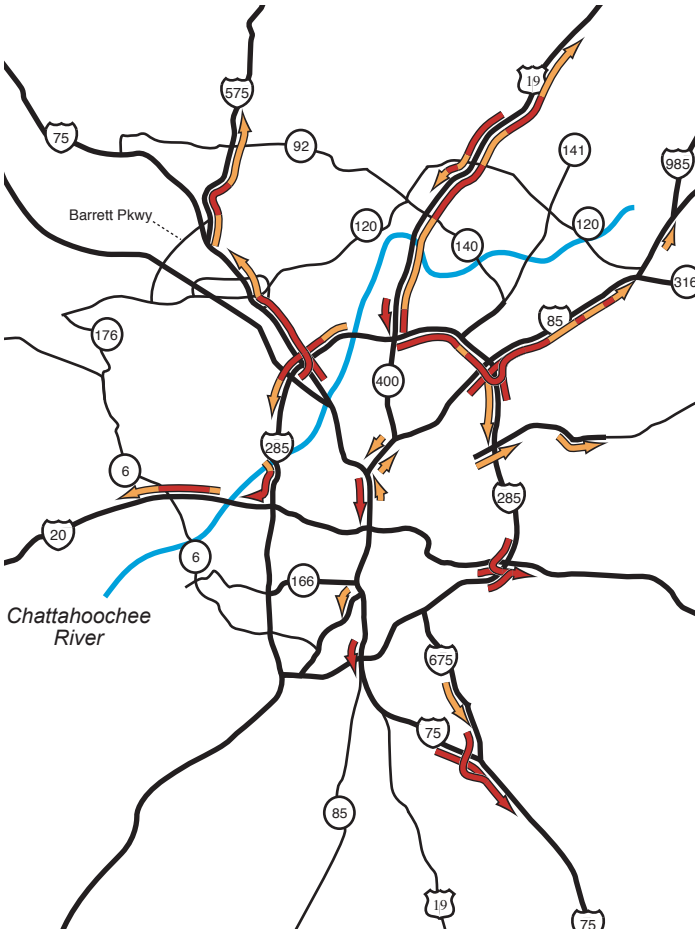
movements in the northern and western areas are to get to one of these two corridors. Some of the most congested arterial corridors are those that parallel I-75 and SR 400: US 19 / 41 through Kennesaw and Marietta, and SR 9 through Alpharetta and Roswell.

Another reality that influences the level of highway demand is that the "center of gravity" of the region's work centers is north of downtown Atlanta, with many job centers located near the northern interchanges of I-285 and I-85. Thus the greater traffic flows on I-285 are to the north in the morning and to the south in the evening; accordingly, congestion on I-285 also follows those patterns. South of Atlanta, I-75/I-85 carries demand not only to downtown Atlanta in the morning, but also toward the northern employment centers, and thus is one of the most congested corridors. During the evening peak period in the other direction, heavy southbound flow on I-75/I-85 toward downtown Atlanta competes with homeward-bound traffic leaving the downtown area; this results in greater congestion toward the central business district than away from it.

There is also congestion found on state routes in the outlying counties that appears to be local in nature. Bottlenecks of this type are found in Cumming / Silver City, Buford, Gainesville, Lawrenceville, Loganville, Winder / Russell, Covington, McDonough, Lovejoy, Fayetteville, Peachtree City, Newnan, Douglasville, Dallas / Hiram, and Cartersville. While many of these problems do not appear significant compared to the congestion on the high-volume corridors closer to Atlanta, in fact some long, single-file queues routinely recur on country roads where drivers do not have viable alternative routes; it is clear that rural delays in many case are substantial.

Lastly, it should be noted that in the Atlanta area, as in any large metropolitan area, about 10-20 percent of highway lane-miles actually operate under congested conditions (this figure varies widely depending on definitions of congestion). Still, it is evident from system-wide aerial photography that highway traffic moves with relative freedom on the majority of the system. Perceptions that the network is "grid-locked" are false, even when ordinary incidents occur that block traffic flow. (While major incidents are capable of causing grid-lock in a local area, incidents of such magnitude are much less frequent than generally perceived.) Therefore, while the focus of this program is where mobility is inhibited by congestion, it should also be recognized that many parts of the system operate efficiently and at high travel speeds on a daily basis during the peak demand periods.

CONGESTED FREEWAY ZONES / EVENING 2005



Above: Red arrows depict more severe freeway congestion; orange arrows depict less severe or intermittent congestion. (Interrupted-flow arterial routes are shown for orientation only; arterial bottlenecks are not shown.)

Congested Freeway Zones and Rankings

The aerial survey performance measurement process derives the average density of traffic flowing on each freeway link from overlapping time-lapse digital photography taken over four days at one-hour intervals. The morning periods are 6:30 to 9:30 a.m.; the evening periods are 4:00 to 7:00 p.m. After counts have been taken from the photography and densities have been calculated for all links (by direction and time period), a screening is performed to identify and exclude atypical data – values either well above or below normal levels from the other days. The resulting averaged density values are then converted to level-of-service performance ratings "A" through "F" based on ranges defined in the 2000 Highway Capacity Manual. The performance ratings database, therefore, contains six ratings for each highway segment, per direction: one for each of three morning hours, and one for each of three evening hours.

Because there is a mathematical correlation between the underlying freeway densities and average travel speeds, it is possible to estimate average travel times for each link during each of the six surveyed hours; those times can then be added together to estimate travel times between any two interchanges. Once the travel time has been estimated, then the average speed can be estimated as well by using the total estimated travel time and the distance between the two endpoints. An estimate of total minutes delay can also be calculated, by subtracting the time it would have taken driving at 60 mph from the actual (estimated) travel time based on measured density.

This methodology was used to generate morning and evening delay totals through the significant congested zones found on the freeway system during the 2005 survey dates. Morning and evening delay totals were listed by zone, and then sorted from greatest to least delay. From this list, a ranking was determined by taking the most congested minutes-of-delay total for each congested zone. The complete findings are posted in the tables below.

FREEWAYS / MORNING PERIOD / 2005

FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES

COUNTY (vicinity)	PERIOD AM	ROUTE	Dir	CONGESTED ZONE (from)		(to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	RANK AM
Forsyth	7:30 - 8:30	**SR 400**	SB	SR 20 (BUFORD HWY)	to	I-285	24.0	25	57.7	>30 min.	#1
Cobb	7:30 - 8:30	**I-75**	SB	SR 92	to	I-285	18.2	27	41.0	>20	#2
Cherokee	6:30 - 7:30	**I-575**	SB	SIXES RD	to	I-75	11.1	23	28.4	>10	top 5
Dekalb	7:30 - 8:30	**I-285**	NB,WB	I-20	to	SR 400	19.3	32	35.6	>10	top 5
Gwinnett	6:30 - 7:30	**I-85**	SB	OLD PEACHTREE RD	to	PLEASANTDALE RD	12.2	30	24.6	>10	top 5
Fulton	7:30 - 8:30	**I-75/I-85**	NB	SR 166 (LAKEWOOD FWY)	to	US 29 (NORTH AVE)	5.8	23	15.0	>5	top 10
Fulton	6:30 - 7:30	**I-20**	EB	CAMPBELLTON ST	to	I-285	14.9	39	23.1	>5	top 10
Fulton	7:30 - 8:30	**I-285**	NB,EB	BOLTON RD	to	SR 400	13.6	38	21.3	>5	top 10
Dekalb	6:30 - 7:30	**I-20**	WB	SR 124 (TURNER HILL RD)	to	I-285	8.9	33	16.3	>5	top 10
Dekalb	7:30 - 8:30	**I-20**	WB	GRESHAM RD	to	I-75/85	5.9	32	11.1	>5	top 10
Gwinnett	6:30 - 7:30	**SR 316**	WB	SUGARLOAF PKWY	to	I-85	2.0	18	6.7	>3	top 20
Dekalb	7:30 - 8:30	**I-85**	SB	SR 155 (CLAIRMONT RD)	to	SR 10 (FREEDOM PKY)	8.0	40	11.9	>3	top 20
Fulton	7:30 - 8:30	**I-75/I-85 HOV**	NB	SR 166 (LAKEWOOD FWY)	to	SR 10 (FREEDOM PKY)	4.7	34	8.4	>3	top 20
Fulton	6:30 - 7:30	**SR 400**	NB	NORTHRIDGE RD	to	SR 120 (OLD MILT. PKY)	7.6	40	11.3	>3	top 20
Cobb	8:30 - 9:30	**I-75**	SB	I-285	to	US 29 (NORTH AVE)	8.9	43	12.3	>3	top 20
Gwinnett	7:30 - 8:30	**SR 141**	SB	JONES MILL RD	to	I-285	2.8	28	5.9	>3	top 20
Gwinnett	6:30 - 7:30	**US 78**	WB	PARK PLACE BLVD	to	I-285	8.2	45	11.0	<3	top 20
Henry	7:30 - 8:30	**I-75**	NB	HAMPTON RD	to	HUDSON BRIDGE RD	6.2	42	8.9	<3	top 20
Clayton	7:30 - 8:30	**I-75**	NB	US 19/41	to	I-285	3.4	36	5.6	<3	top 20
Gwinnett	7:30 - 8:30	**I-85 HOV**	SB	SR 316	to	INDIAN TRAIL RD	4.2	51	5.0	<1	top 20
Fulton	7:30 - 8:30	**I-20**	EB	M.L.K. JR DR	to	JOSEPH LOWERY BLVD	1.8	44	2.4	<1	-
Clayton	7:30 - 8:30	**I-675**	NB	SR 42 / US 23	to	ELLENWOOD RD	2.7	52	3.1	<1	-

FREEWAYS / EVENING PERIOD / 2005

FOUR-DAY "SNAPSHOT" RANKING OF CONGESTED ZONES

COUNTY (vicinity)	PERIOD PM	ROUTE	Dir	CONGESTED ZONE (from)		(to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	RANK
Forsyth	17:00 - 18:00	**SR 400**	NB	GLENRIDGE PER. CONN.	to	SR 141	21.9	31	42.0	>20 min.	#1
Dekalb	17:00 - 18:00	**I-285**	EB,SB	SR 400	to	SR 12 (COVINGTON HWY)	16.5	35	28.1	>10	#2
Gwinnett	17:00 - 18:00	**I-85**	NB	CHAMBLEE-TUCKER RD	to	SR 316	11.4	32	21.3	>5	top 5
Fulton	17:00 - 18:00	**I-85 (I-75)**	SB	SR 400	to	I-20	6.0	24	14.7	>5	top 5
Cobb	17:00 - 18:00	**I-75**	NB	MT PARAN RD	to	CHASTAIN RD	14.3	37	23.0	>5	top 5
Forsyth	17:00 - 18:00	**SR 400**	SB	McFARLAND RD	to	GLENRIDGE PER. CONN.	17.7	42	25.1	>5	top 10
Cherokee	17:00 - 18:00	**I-575**	NB	I-75	to	TOWNE LAKE PKY	7.8	37	12.6	>3	top 10
Henry	17:00 - 18:00	**I-75**	SB	SR 138 (STOCKBRIDGE PKY)	to	HUDSON BRIDGE RD	4.5	32	8.4	>3	top 10
Fulton	17:00 - 18:00	**I-285**	WB	ROSWELL RD	to	PACES FERRY RD	7.5	41	11.1	>3	top 10
Cobb	18:00 - 19:00	**I-20**	WB	SIX FLAGS DR	to	LEE RD	5.3	39	8.1	<3	top 10
Clayton	17:00 - 18:00	**I-75**	SB	US 19/41 (HENRY FORD AVE)	to	SR 331 (FOREST PKY)	2.2	27	4.9	<3	top 20
Dekalb	17:00 - 18:00	**I-20**	EB	SR 155	to	WESLEY CHAPEL RD	3.2	34	5.7	<3	top 20
Gwinnett	17:00 - 18:00	**US 78**	EB	SR 8	to	PARK PLACE BLVD	9.3	50	11.3	<3	top 20
Fulton	16:00 - 17:00	**I-285**	SB	BOLTON RD	to	I-20	2.6	34	4.5	<3	top 20
Gwinnett	17:00 - 18:00	**I-85**	NB	OLD PEACHTREE RD	to	SR 20	6.1	47	7.7	<3	top 20
Fulton	18:00 - 19:00	**I-85**	NB	I-20	to	SR 400	5.6	50	6.7	<3	top 20
Gwinnett	17:00 - 18:00	**SR 316**	EB	SR 120	to	WALTHER BLVD	0.6	21	1.7	<3	top 20
Clayton	17:00 - 18:00	**I-675**	SB	ELLENWOOD RD	to	SR 42 / US 23	2.7	44	3.7	<3	top 20
Gwinnett	17:00 - 18:00	**I-85 HOV**	NB	I-285	to	SR 140 (J CARTER BLVD)	3.3	50	4.0	<1	top 20
Fulton	16:00 - 17:00	**I-75/I-85 HOV**	SB	I-85	to	US 29 (NORTH AVE)	1.3	40	2.0	<1	top 20

Note: These rankings are based on what was found during an averaged four-day "snap-shot" of the system, minus data judged to represent atypical conditions. This sample size usually will dampen out most - but not all - significant daily variation.

This ranking list, however, does not take into account duration of congestion. Therefore, a similar analysis was performed by screening the performance ratings database for zones that were severely congested (densities of 60 passenger cars per lane per mile or greater) for periods of either two or three hours. (These zones were almost always sub-zones of the congested zones previously discussed.) Using the simplification of one median density value for each congested zone, separate rankings were made for two-hour congested zones and for three-hour zones. Those results are also posted in the tables below.

FREEWAY RANKINGS / 2005 / MORNING AND EVENING

2-HOUR DURATION CONGESTED ZONES

PERIOD:	ROUTE	DIR	CONGESTED ZONE (from)	(to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	RANK AM
MORNING (AM)									
6:30-8:30	SR 400	SB	McFarland Rd...	to ...approaching Northridge Rd	11	21	31.4	>20 min.	#1
6:30-8:30	I-575	SB	Appr. Towne Lake Pky...	to ...I-75 merge	8	21	22.9	>10	#2
7:30-9:30	I-75/85	NB	I-85 merge (south side)...	to ...SR 10 Freedom Pky	6	18.5	19.5	>10	top 5
6:30-8:30	I-20	WB	Turner Hill Rd...	to ...Wesley Chapel Rd	7.5	29	15.5	>5	top 5
6:30-8:30	I-20	EB	Lee Rd...	to ...Six Flags Dr	5.5	26	12.7	>5	top 5
6:30-8:30	I-285	NB	Chamblee-Tucker Rd...	to ...N. Peachtree Rd	4	23	10.4	>5	top 10
6:30-8:30	SR 316	WB	Sugarloaf Pky...	to ...I-85	2.5	21	7.1	>3	top 10
6:30-8:30	SR 400	NB	Approaching Mansell Rd...	to ...Haynes Bridge Rd	2.5	29	5.2	<3	top 10
6:30-8:30	I-285	NB	Ponce de Leon Ave...	to ...US 29 (SR 8)	1.5	23	3.9	<3	top 10
7:30-9:30	I-20	WB	Glenwood Ave...	to ...Moreland Ave	1.3	26	3.1	<3	top 10
6:30-8:30	I-75	NB	Forest Pky...	to ...I-285	1	26	2.3	<3	-
6:30-8:30	I-75	NB	Jonesboro Rd...	to ...Jodeco Rd	1.5	32.5	2.8	<3	-
EVENING (PM)									PM
4:00-6:00	I-285	EB	Chamblee-Dunwoody Rd...	to ...LaVista Rd	7	26	16.2	>5 min.	#1
5:00-7:00	SR 400	SB	Windward Pky...	to ...Holcomb Bridge Rd	6	32.5	11.1	>5	#2
4:00-6:00	I-75	SB	Appr. I-285 (south side)...	to ...Forest Pky	2	23	5.2	>3	top 5

FREEWAY RANKINGS / 2005 / MORNING AND EVENING

3-HOUR DURATION CONGESTED ZONES

PERIOD:	ROUTE	DIR	CONGESTED ZONE (from)	(to)	DIST (miles)	EST. AVG SPEED (mph)	EST. TRAV TIME (min)	EST. ZONE DELAY vs. 60 mph	RANK AM
MORNING (AM)									
6:30-9:30	I-85	SB	Approaching Duluth Hwy...	...Indian Trail Rd	7	23	18.3	>10 min.	#1
6:30-9:30	316/I-85	SB	Sugarloaf Pky on SR 316...	...Indian Trail Rd on I-85	7	26	16.2	>5	#2
6:30-9:30	I-75	SB	Wade Green Rd...	...Barrett Pky	3.5	21	10.0	>5	top 5
EVENING (PM)									PM
4:00-7:00	I-75/85	SB	I-75/85 merge (Brookwood)...	...SR 10 Freedom Pky	4	18.5	13.0	>5 min.	#1
4:00-7:00	SR 400	NB	Approaching Mansell Rd...	...SR 120 / Old Milton Pky	4	21	11.4	>5	#2
4:00-7:00	I-85	NB	Appr. I-285 (Chamblee)...	...Jimmy Carter Blvd	4	23	10.4	>5	top 5
4:00-7:00	I-75	SB	Approaching I-675...	...after I-675 merge	2	18.5	6.5	>3	top 5
4:00-7:00	SR 400	SB	Abernathy Rd...	...I-285	1.5	23	3.9	<3	top 5

Note: These rankings are based on what was found during an averaged four-day "snap-shot" of the system, minus data judged to represent atypical conditions. This sample size usually will dampen out most - but not all - significant daily variation.

Congested signalized arterial zones

The nature of a severely congested arterial zone is that it usually is comprised of a series of closely-spaced congested signalized intersections. The most severely-congested arterial zones -- especially during the morning period -- include those that most closely parallel the most severely congested freeway zones, or else carry traffic toward those corridors: US 19 / 41 through Kennesaw and Marietta (parallel to I-75); SR 9 through Alpharetta (parallel to SR 400); SR 120 approaching I-75 from the west through Marietta; SR 92 approaching SR 400 through Roswell from the west; and three arterials approaching SR 400 from the east: SR 140, SR 961 and SR 120. While the barrier-nature of the Chattahoochee River indirectly affects all of those routes, it also directly generates severe local congestion near each of its bridges -- SR 140, SR 141, SR 120 and SR 20 to the northeast; and SR 92 and SR 6 (to the southwest in Douglas County).

Inside the I-285 perimeter, the narrow arterials winding through DeKalb County had many successive bottleneck intersections, particularly along SR 236, SR 8, SR 10, and SR 42. To the east, significance delays were incurred on US 78 through Snellville. Delays were generally less severe to the south; however, major bottlenecks were found along all of the signalized state arterials approaching the vicinity of I-285.

2005 Bottleneck Inventory

Bottleneck inventory (pages 10-31)

The next section presents a map-based bottleneck inventory of the region. More-severe congestion is represented by red arrowheads; less-severe or intermittent congestion is represented by orange arrowheads. The predominant directions of commuter "tidal flows" are evident in these maps, as well as areas where "feeder" or parallel arterial corridors are most affected by congestion.

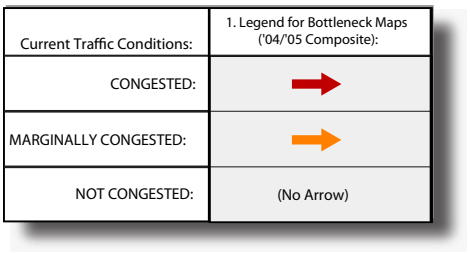
The source of data for these bottleneck maps was the 2004 survey of the regional arterial network, and the 2005 survey of the extended primary network (see network definitions at the front of this report.) More information about each bottleneck is also available through the interactive version on the GDOT website.

Representative aerial photographs have been presented with the maps; the entire archive of aerial bottleneck photography (from which these photos were taken) is available for viewing through the website (see Appendix A for more details).

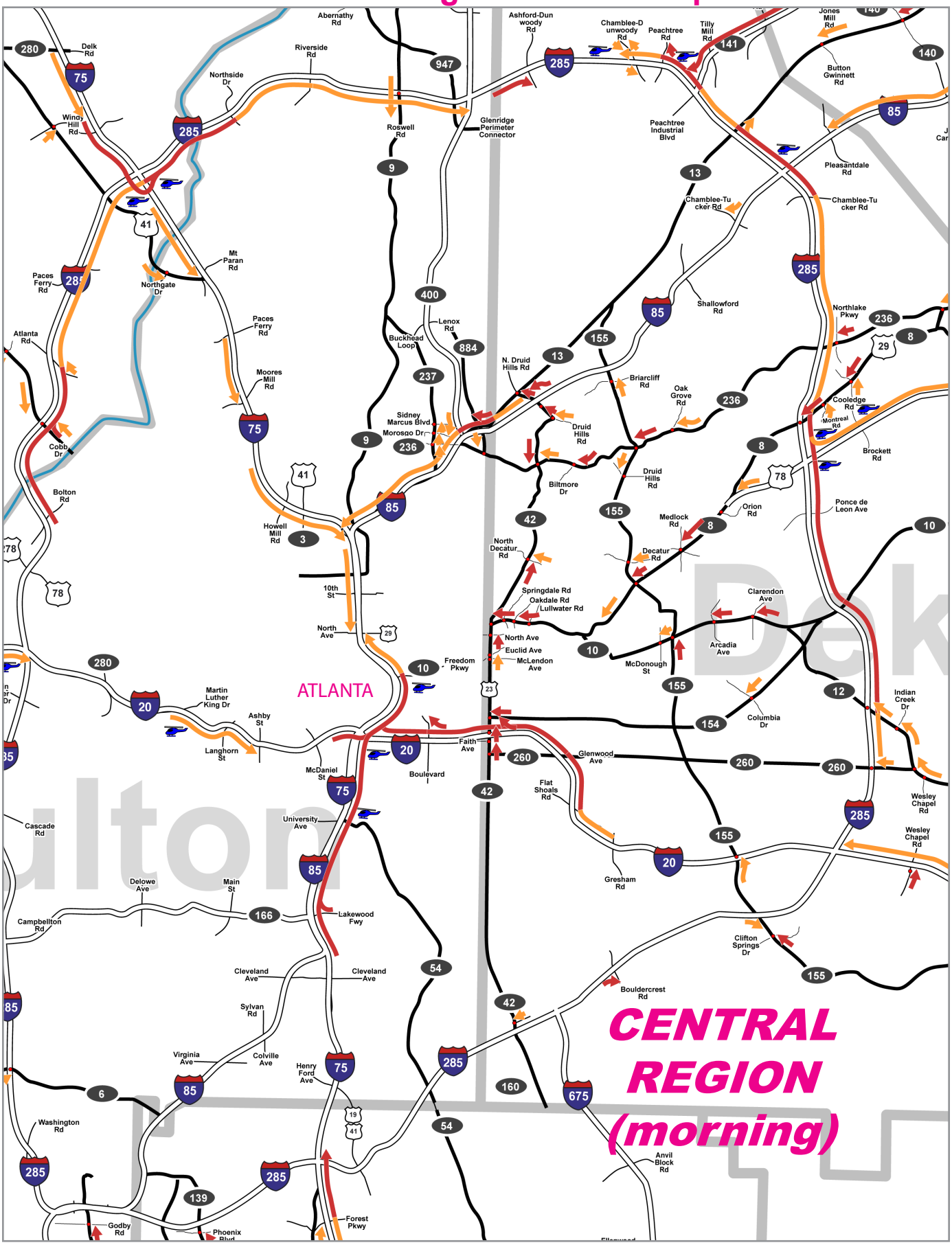
Morning bottleneck map sections:

Evening bottleneck map sections:

LEGEND FOR BOTTLENECK MAPS

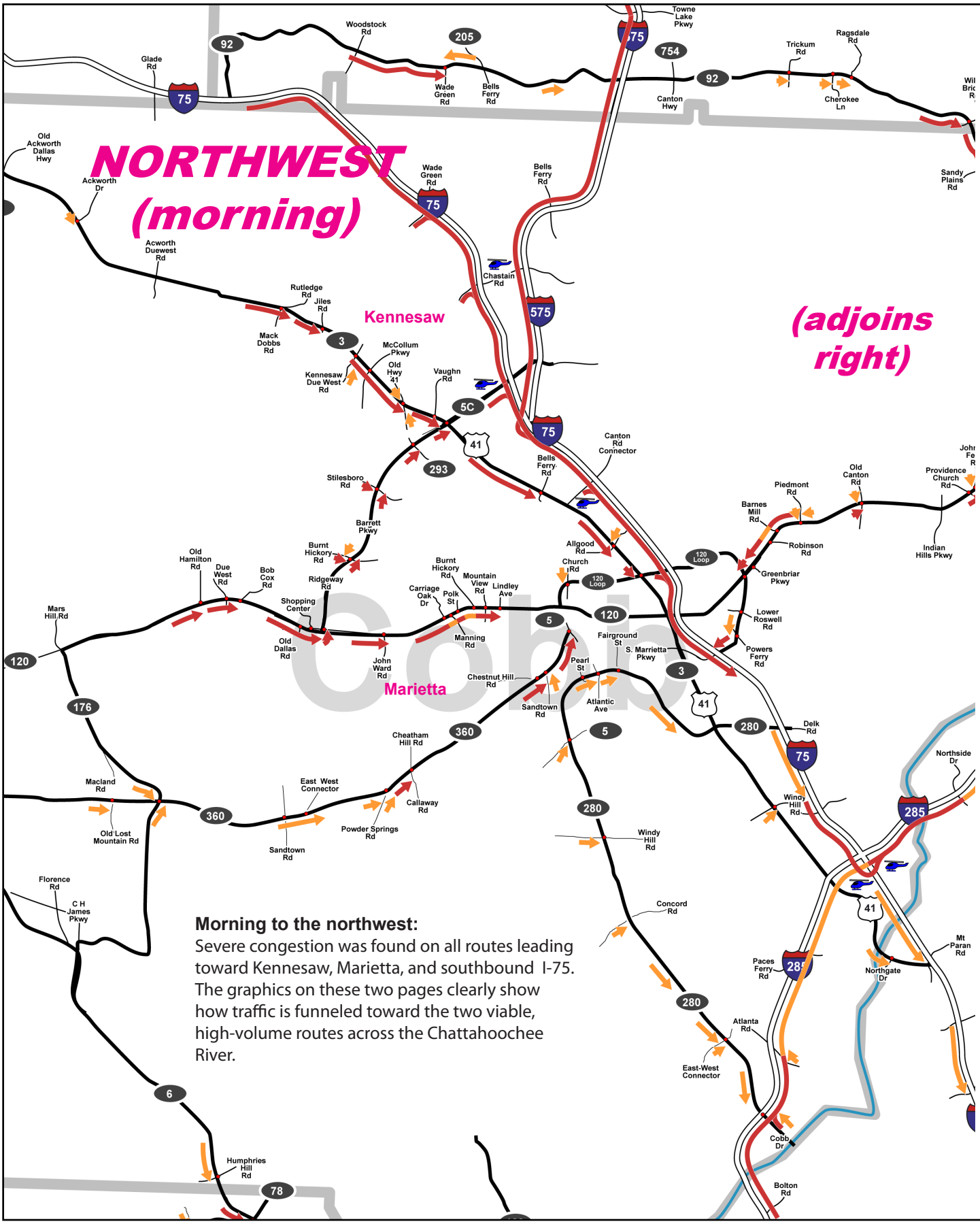


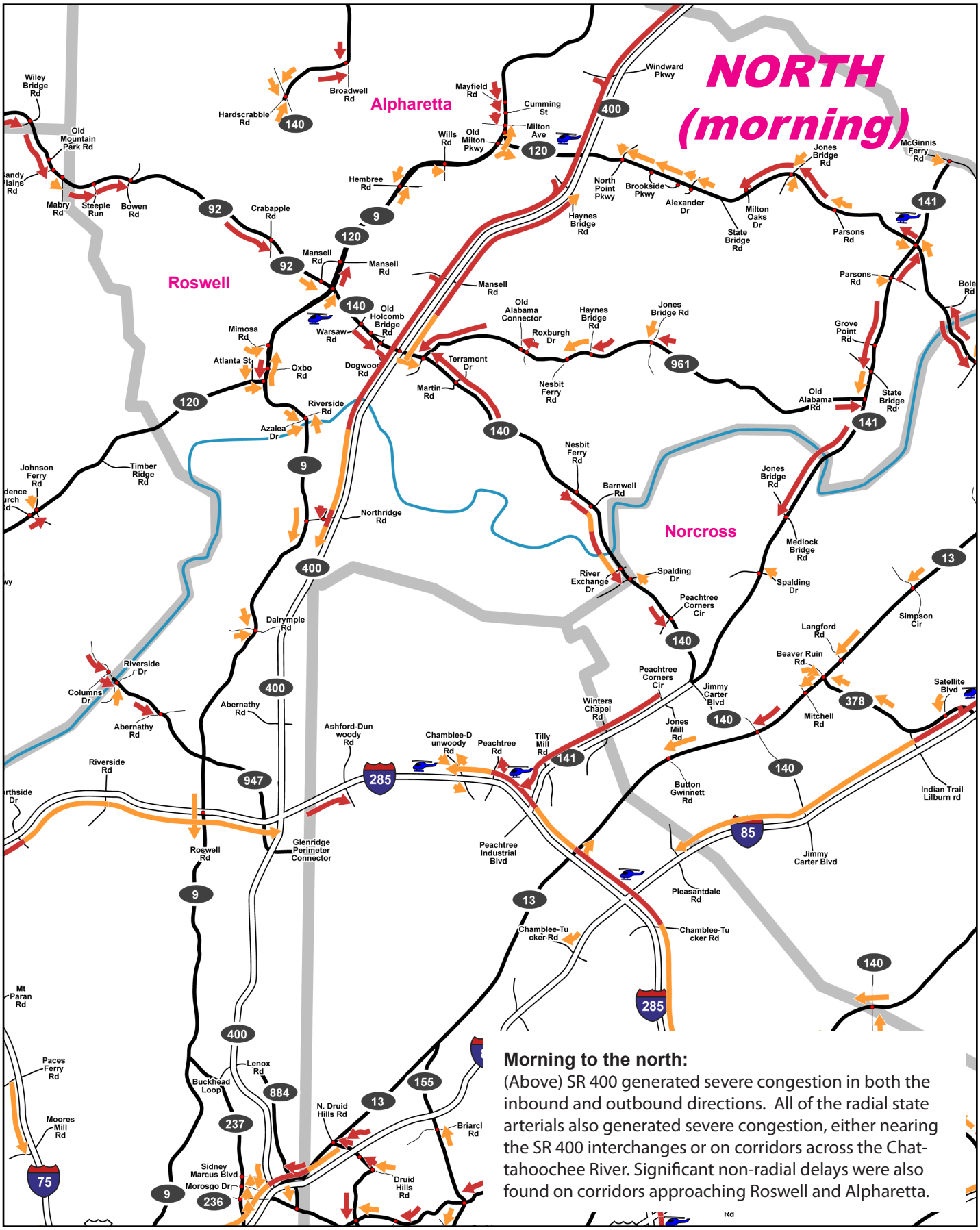
2005 Morning Bottleneck Maps



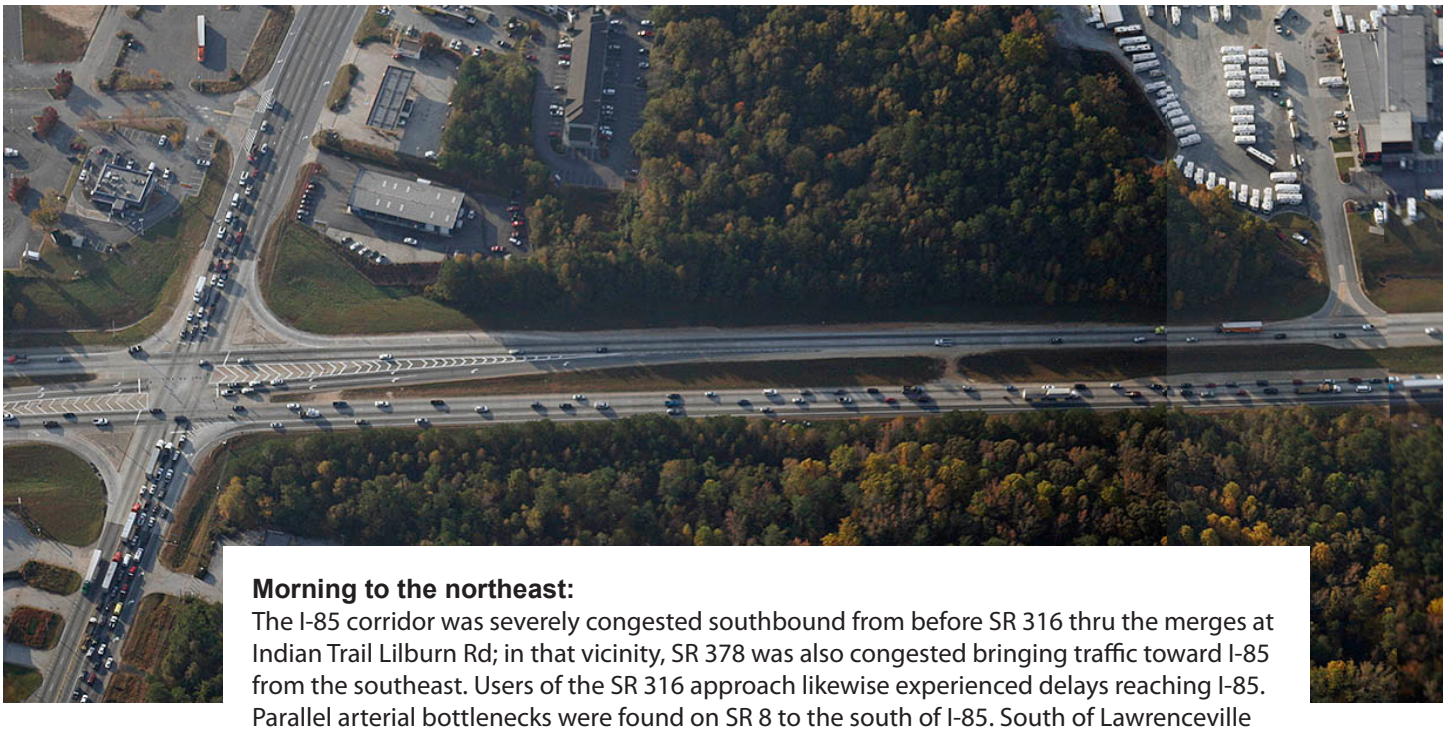
Morning, central region (opposite map):
The primary movements on I-285 during the morning period were to the north, with severe congestion found on both the east and west sides from I-20 toward SR 400. Congestion toward the Atlanta central business district was also found on the radials inside I-285; congestion was particularly severe on northbound I-75/I-85, and on westbound I-20.

Photos (above):
The arterial highways assigned for survey coverage inside I-285 were mostly in DeKalb County; many of these routes generated long, single file queues in between dense residential neighborhoods. These representative photos show two in a series of four (sometimes five) closely-spaced, congested signalized intersections. The route is SR 236 (LaVista Rd) in North Druid Hills. The top photo shows a westbound queue approaching Oak Grove Rd. The bottom shows only part of the next downstream queue, at SR 155 (US 23). The tail of the next queue was typically encountered less than one mile farther downstream; the head of that queue alternated between signals at Jody Lane and Bittmore Drive. Just beyond that, the signal at SR 42 also generate delays, but intermittently.

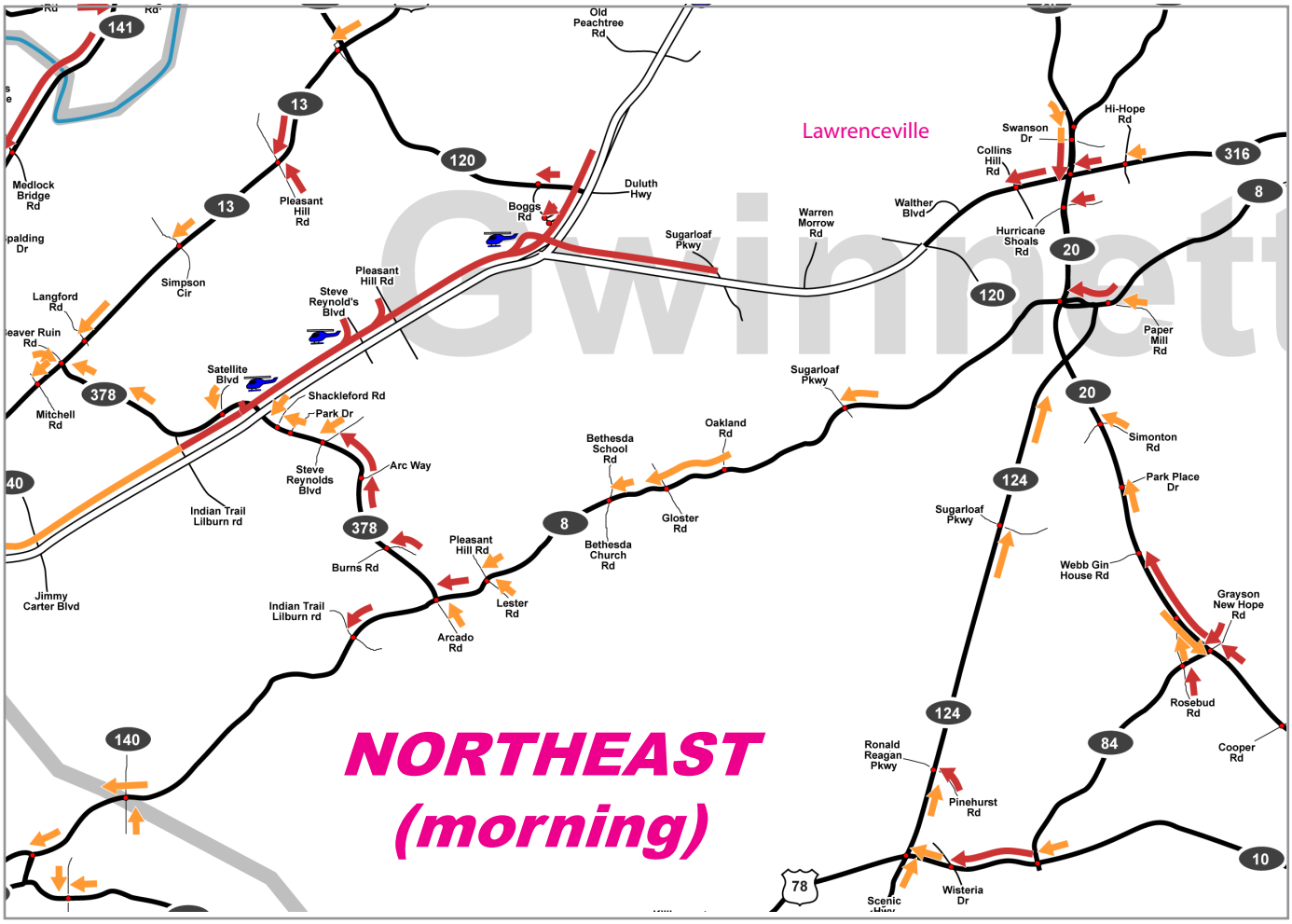

NORTHWEST
(morning)
(adjoins
right)
Kennesaw
Marietta
Cobb
Morning to the northwest:
Severe congestion was found on all routes leading toward Kennesaw, Marietta, and southbound I-75. The graphics on these two pages clearly show how traffic is funneled toward the two viable, high-volume routes across the Chattahoochee River.
Towne Lake Pkwy
Woodstock Rd
Glade Rd
Wade Green Rd
Bells Ferry Rd
Trickum Rd
Ragsdale Rd
Cherokee Ln
Canton Hwy
Old Ackworth Dallas Hwy
Ackworth Dr
Acworth Duewest Rd
Sandy Plains Rd
Chastain Rd
Rutledge Rd
Jiles Rd
Mack Dobbs Rd
McCollum Pkwy
Kennesaw Due West Rd
Old Hwy 41
Vaughn Rd
Canton Rd Connector
Stilesboro Rd
Barrett Pkwy
Burnt Hickory Rd
Ridgeway Rd
Old Hamilton Rd
Due West Rd
Bob Cox Rd
Shopping Center
Old Dallas Rd
John Ward Rd
Mars Hill Rd
Carriage Oak Dr
Polk St
Mountain View Rd
Lindley Ave
Manning Rd
Allgood Rd
Church Rd
Piedmont Rd
Barnes Mill Rd
Old Canton Rd
Providence Church Rd
Indian Hills Pkwy
Robinson Rd
Greenbriar Pkwy
Lower Roswell Rd
Powers Ferry Rd
Fairground St
S. Marrietta Pkwy
Pearl St
Chestnut Hill Rd
Sandtown Rd
Atlantic Ave
Delk Rd
Northside Dr
Windy Hill Rd
Concord Rd
Paces Ferry Rd
Northgate Dr
Mt Paran Rd
Atlanta Rd
East-West Connector
Cobb Dr
Bolton Rd
Cheatham Hill Rd
East West Connector
Callaway Rd
Powder Springs Rd
Macland Rd
Old Lost Mountain Rd
Florence Rd
C H James Pkwy
Humphries Hill Rd



Morning to the north:
(Above) SR 400 generated severe congestion in both the inbound and outbound directions. All of the radial state arterials also generated severe congestion, either nearing the SR 400 interchanges or on corridors across the Chattahoochee River. Significant non-radial delays were also found on corridors approaching Roswell and Alpharetta.



Morning to the northeast:
The I-85 corridor was severely congested southbound from before SR 316 thru the merges at Indian Trail Lilburn Rd; in that vicinity, SR 378 was also congested bringing traffic toward I-85 from the southeast. Users of the SR 316 approach likewise experienced delays reaching I-85. Parallel arterial bottlenecks were found on SR 8 to the south of I-85. South of Lawrenceville on SR 20 and SR 124, arterial bottlenecks not oriented along Atlanta radials were found.



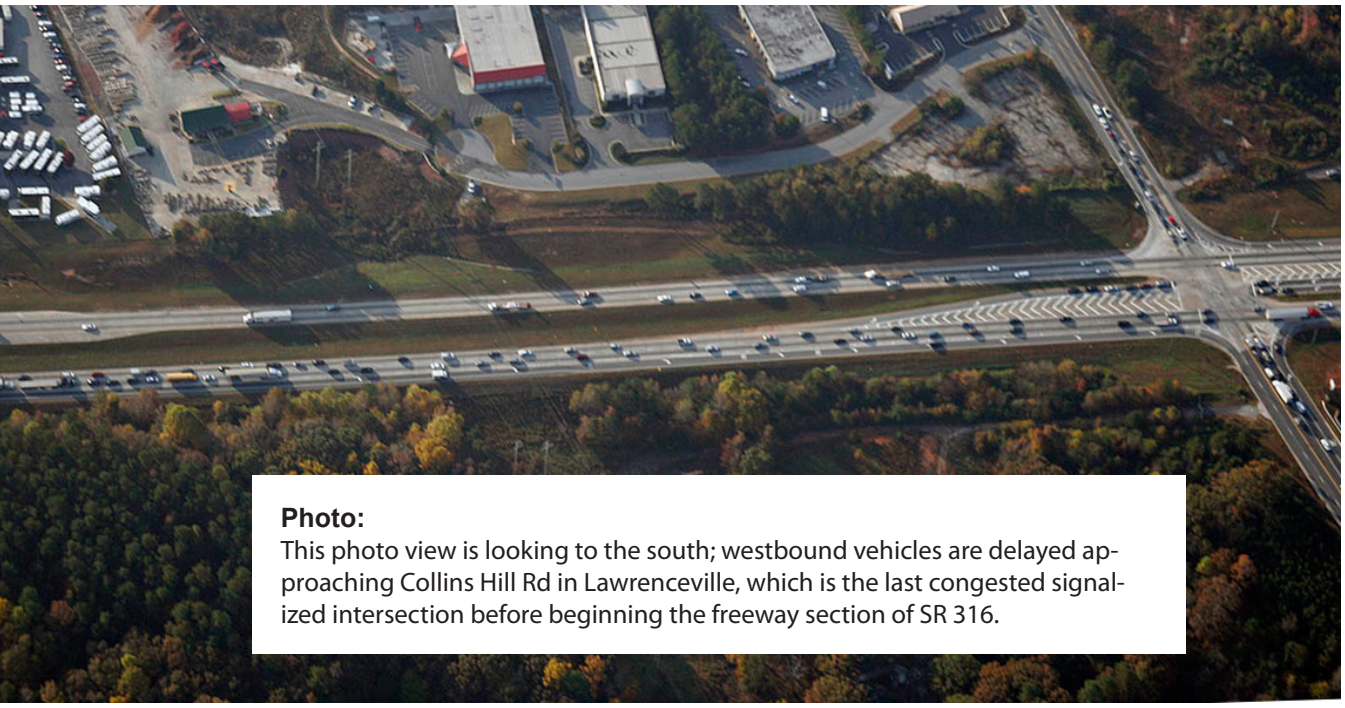
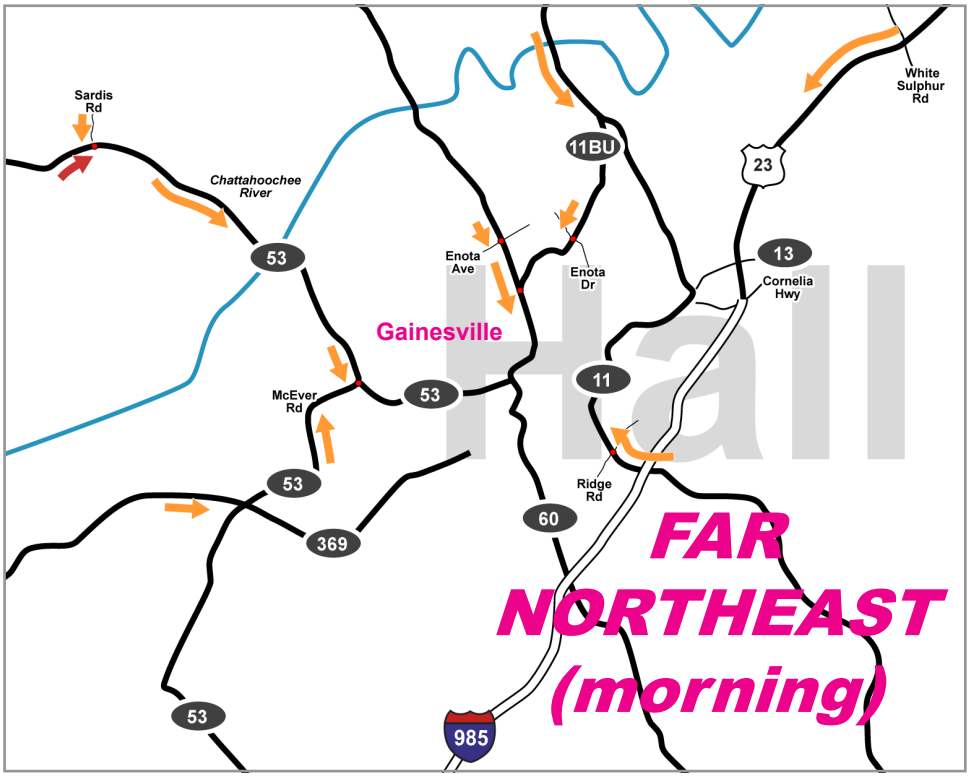
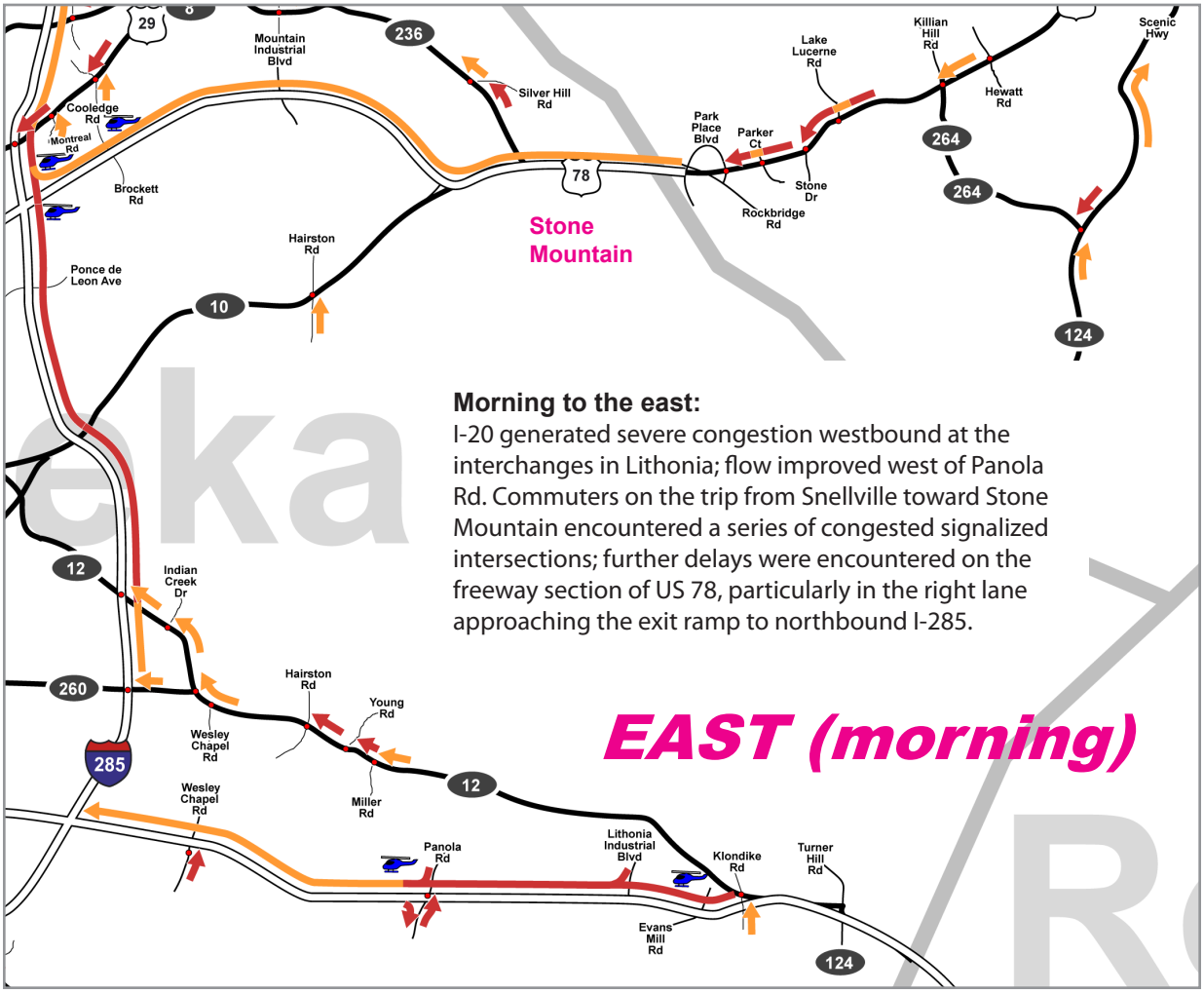


Photo:
This photo view is looking to the south; westbound vehicles are delayed approaching Collins Hill Rd in Lawrenceville, which is the last congested signalized intersection before beginning the freeway section of SR 316.



Morning to the far northeast:
While major congestion was not found in the vicinity of Gainesville, intermittent delays were found in a number of places along routes toward the town center.



Morning to the east:
I-20 generated severe congestion westbound at the interchanges in Lithonia; flow improved west of Panola Rd. Commuters on the trip from Snellville toward Stone Mountain encountered a series of congested signalized intersections; further delays were encountered on the freeway section of US 78, particularly in the right lane approaching the exit ramp to northbound I-285.

EAST (morning)

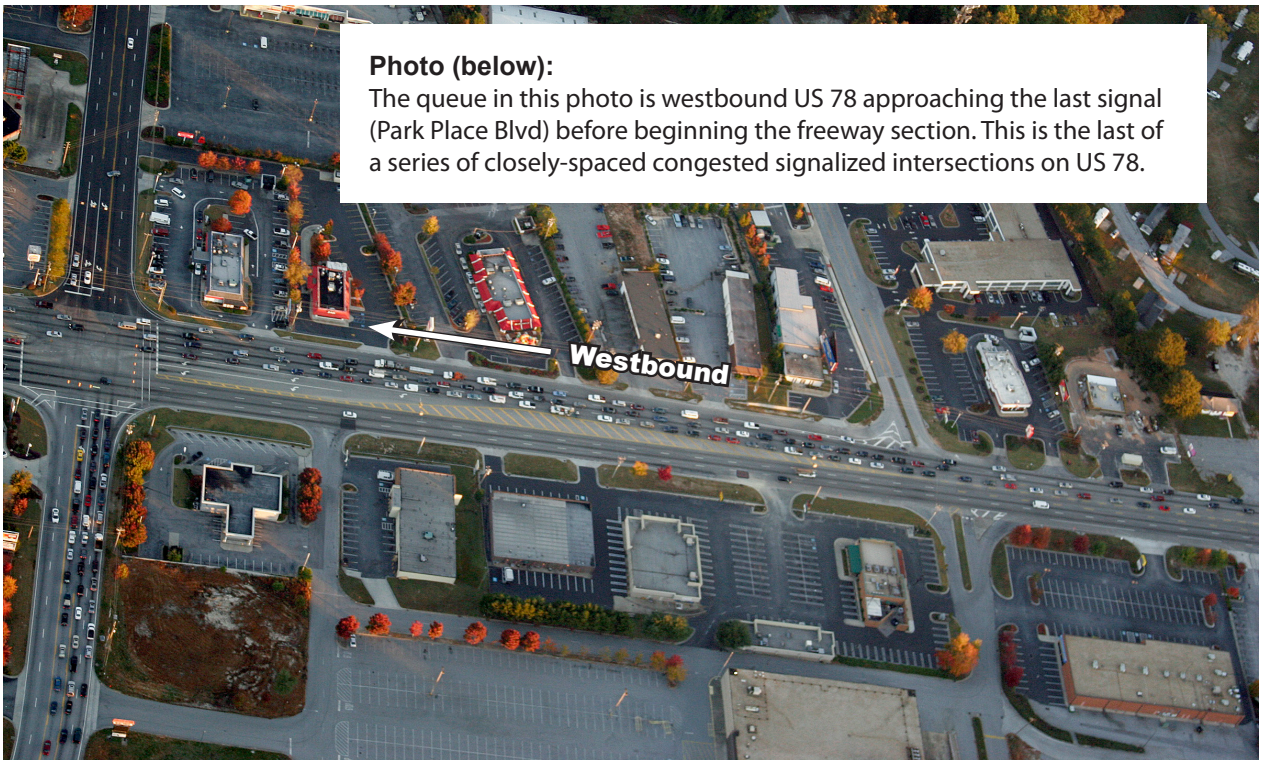
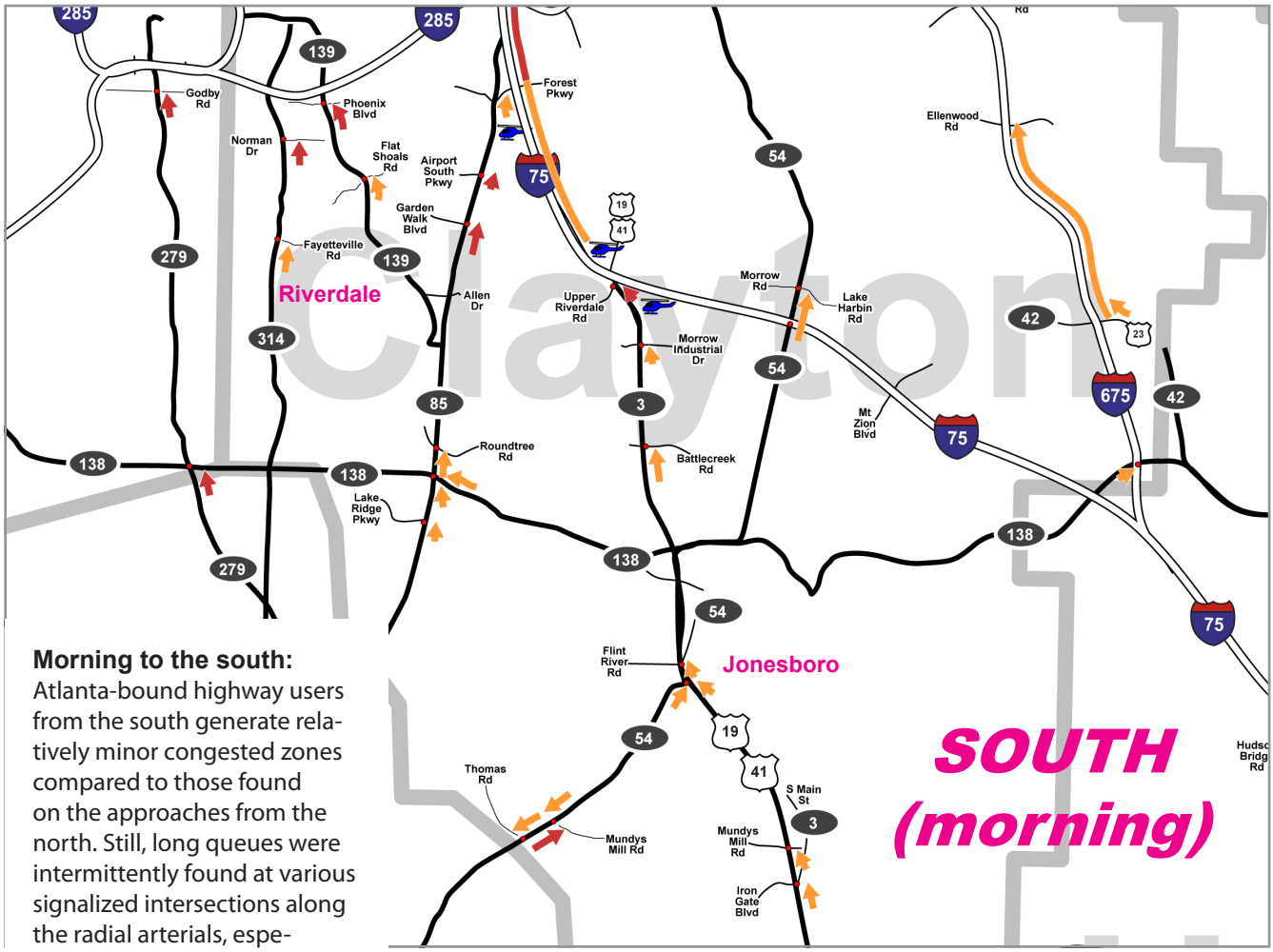


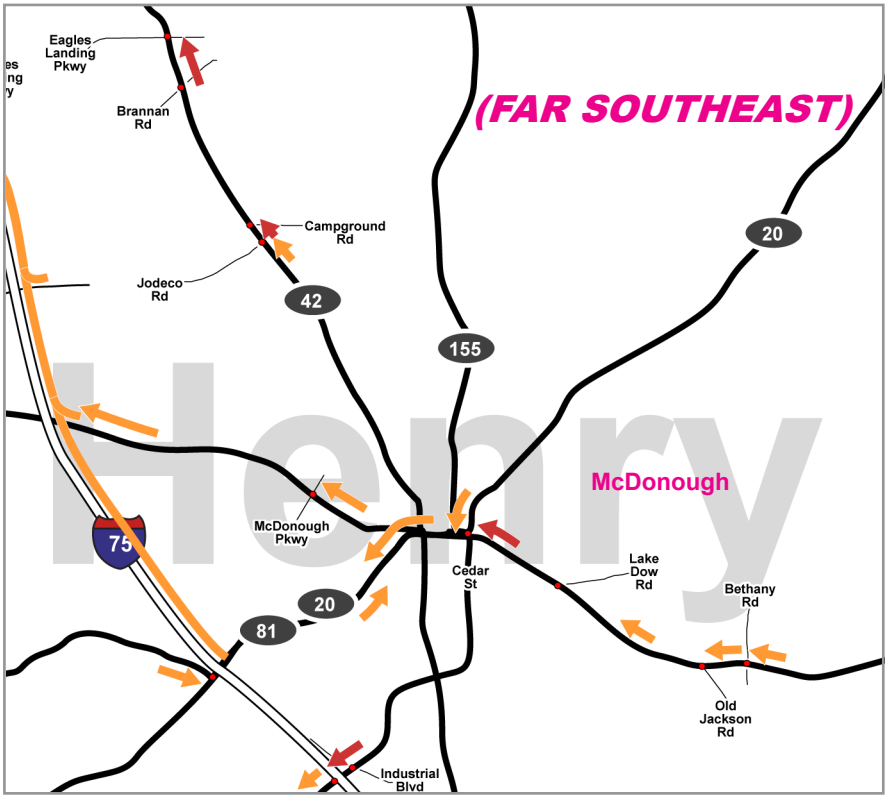
Photo (below):
The queue in this photo is westbound US 78 approaching the last signal (Park Place Blvd) before beginning the freeway section. This is the last of a series of closely-spaced congested signalized intersections on US 78.

Photo:
I-20 between Evans Mill and Panola Rd, looking west toward the Atlanta skyline.

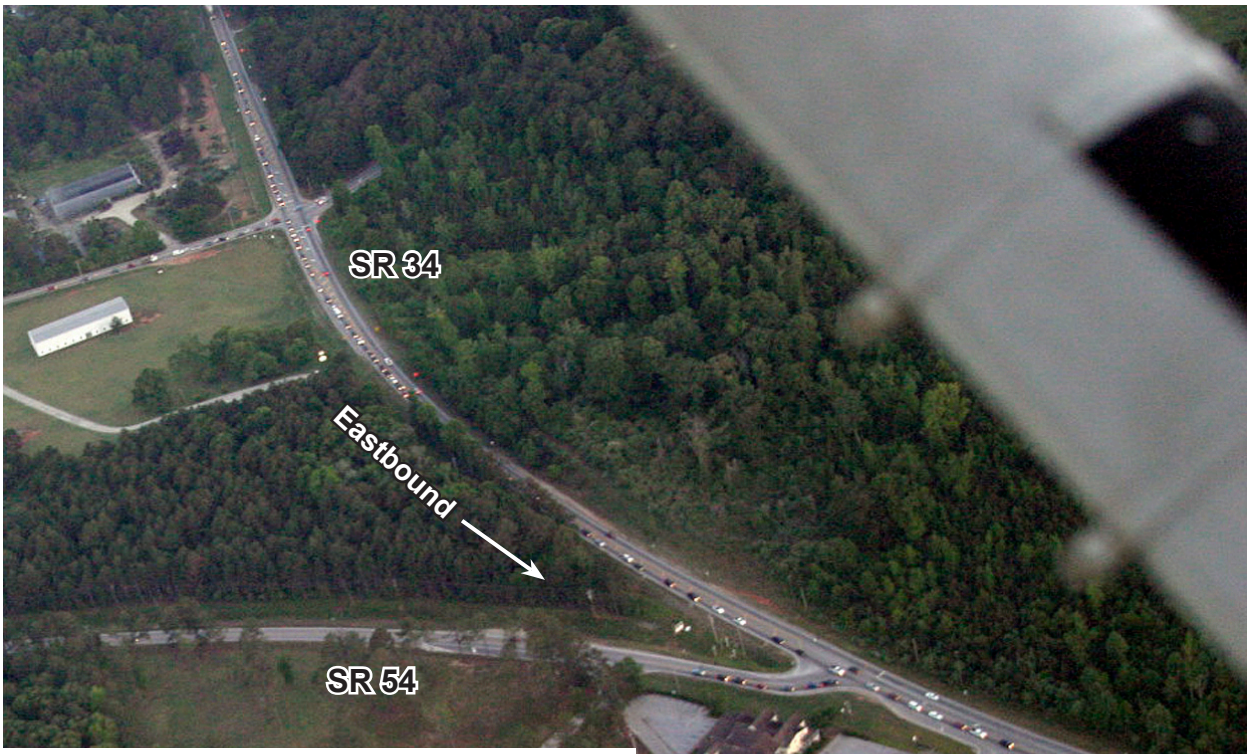
Photo:
The signals on SR 85 at Garden Walk Blvd and Airport South Parkway generated significant northbound delays for users during most observations.



Morning to the south:
Atlanta-bound highway users from the south generate relatively minor congested zones compared to those found on the approaches from the north. Still, long queues were intermittently found at various signalized intersections along the radial arterials, especially where each of the routes neared I-75 or I-285. On the interstates, only minor delays were found on I-675. Weaving and merging on I-75 through the interchanges near and at I-285 generated significant mainline congestion.

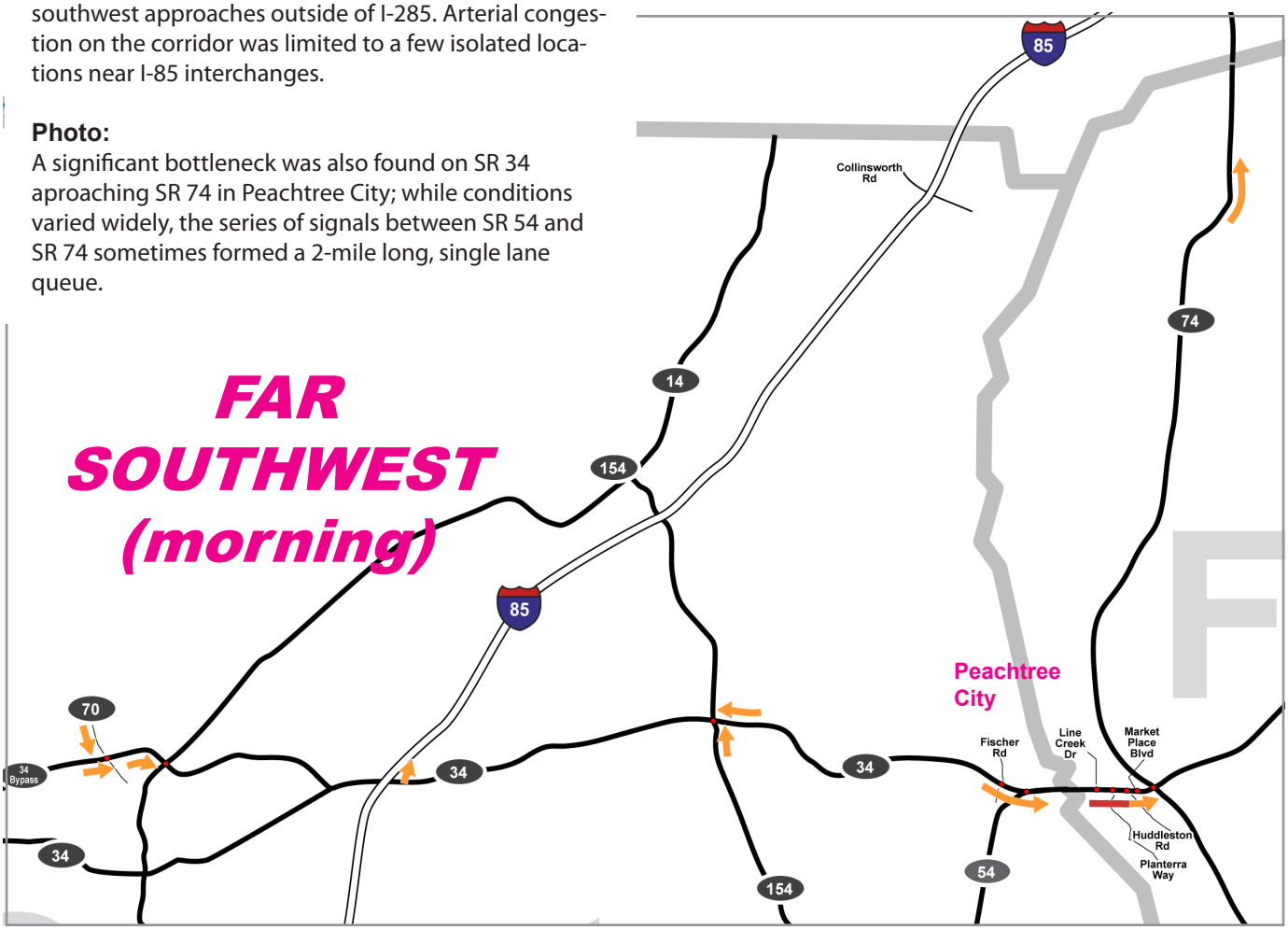


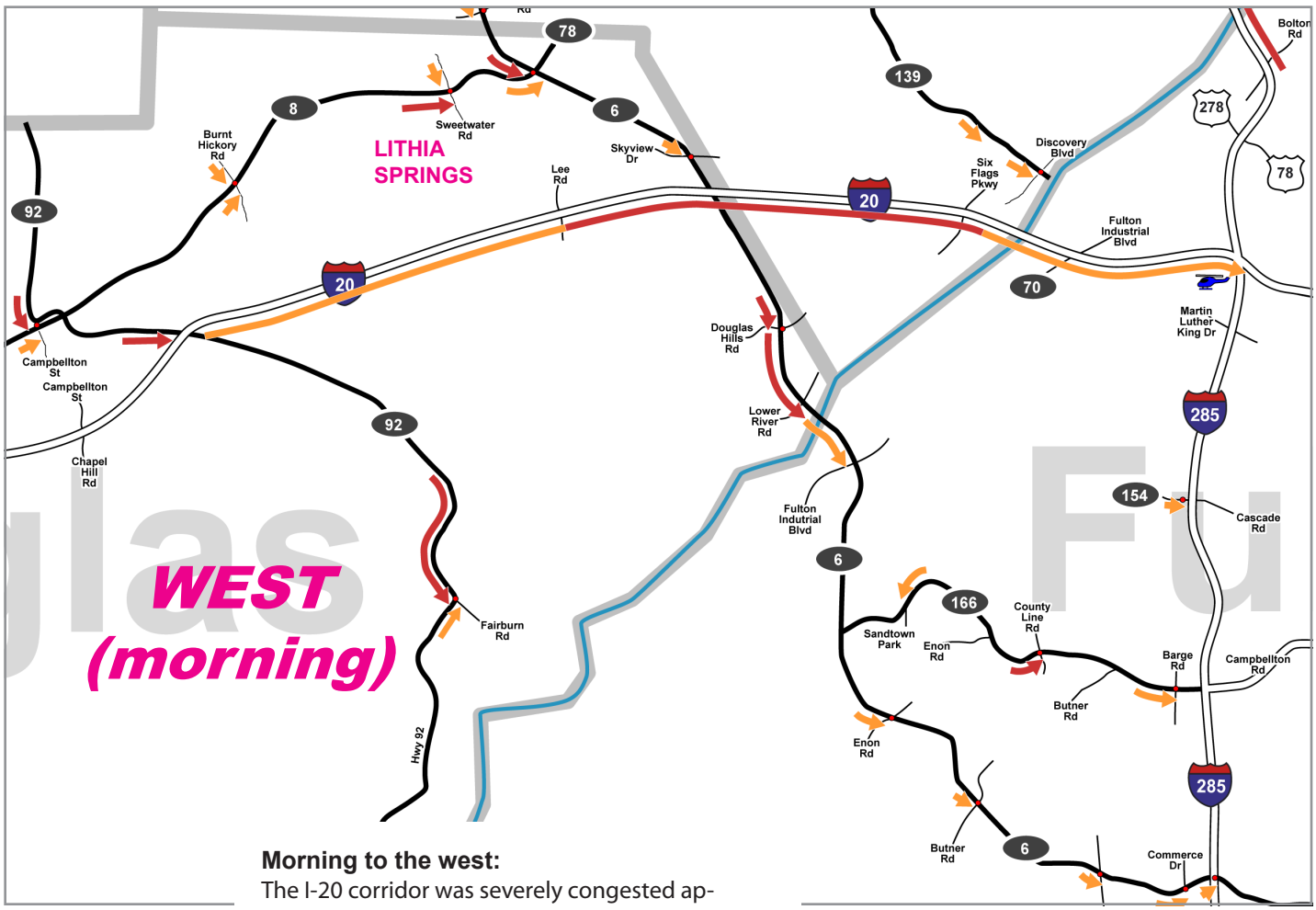
Morning to the far southeast:
Moderate northbound delays are sometimes found on I-75 at the interchanges near McDonough. Significant arterial delays, although usually intermittent, were found at various locations on surveyed routes in McDonough.



Morning to the far southwest:
Mainline congestion on I-85 was never found on the southwest approaches outside of I-285. Arterial congestion on the corridor was limited to a few isolated locations near I-85 interchanges.

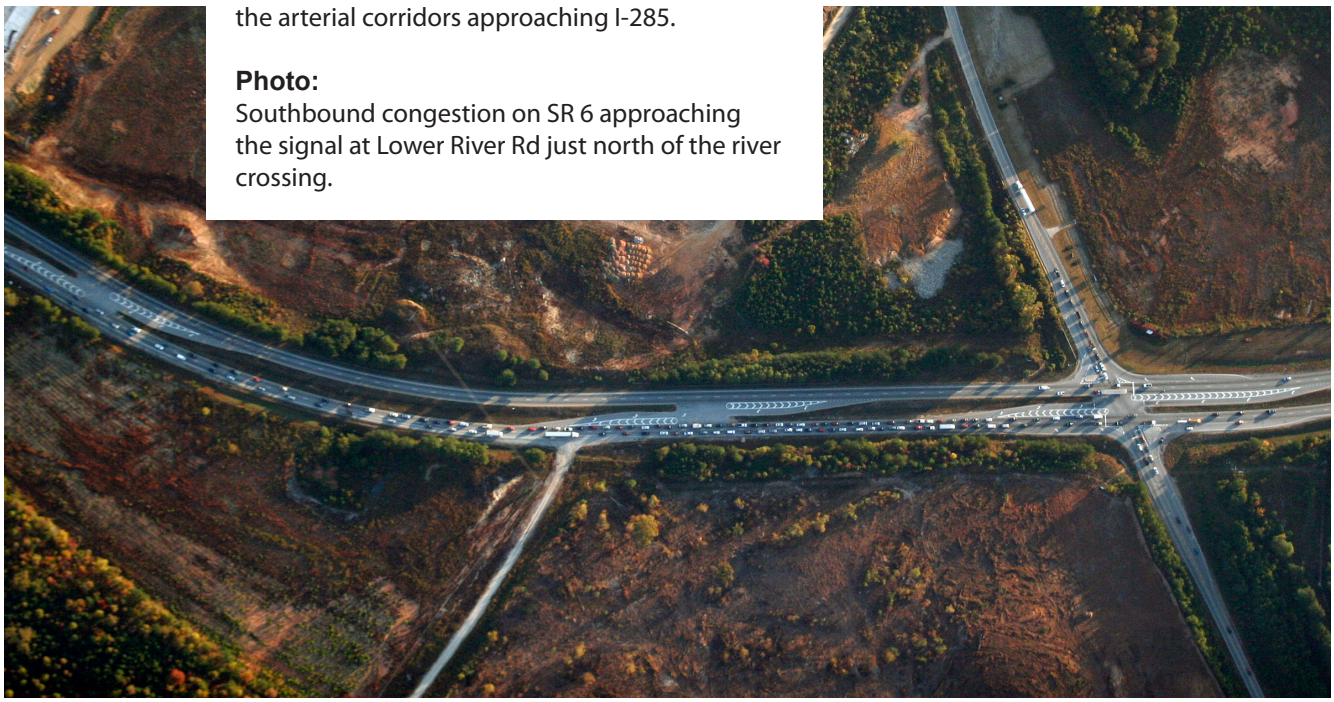
Photo:
A significant bottleneck was also found on SR 34 aproaching SR 74 in Peachtree City; while conditions varied widely, the series of signals between SR 54 and SR 74 sometimes formed a 2-mile long, single lane queue.



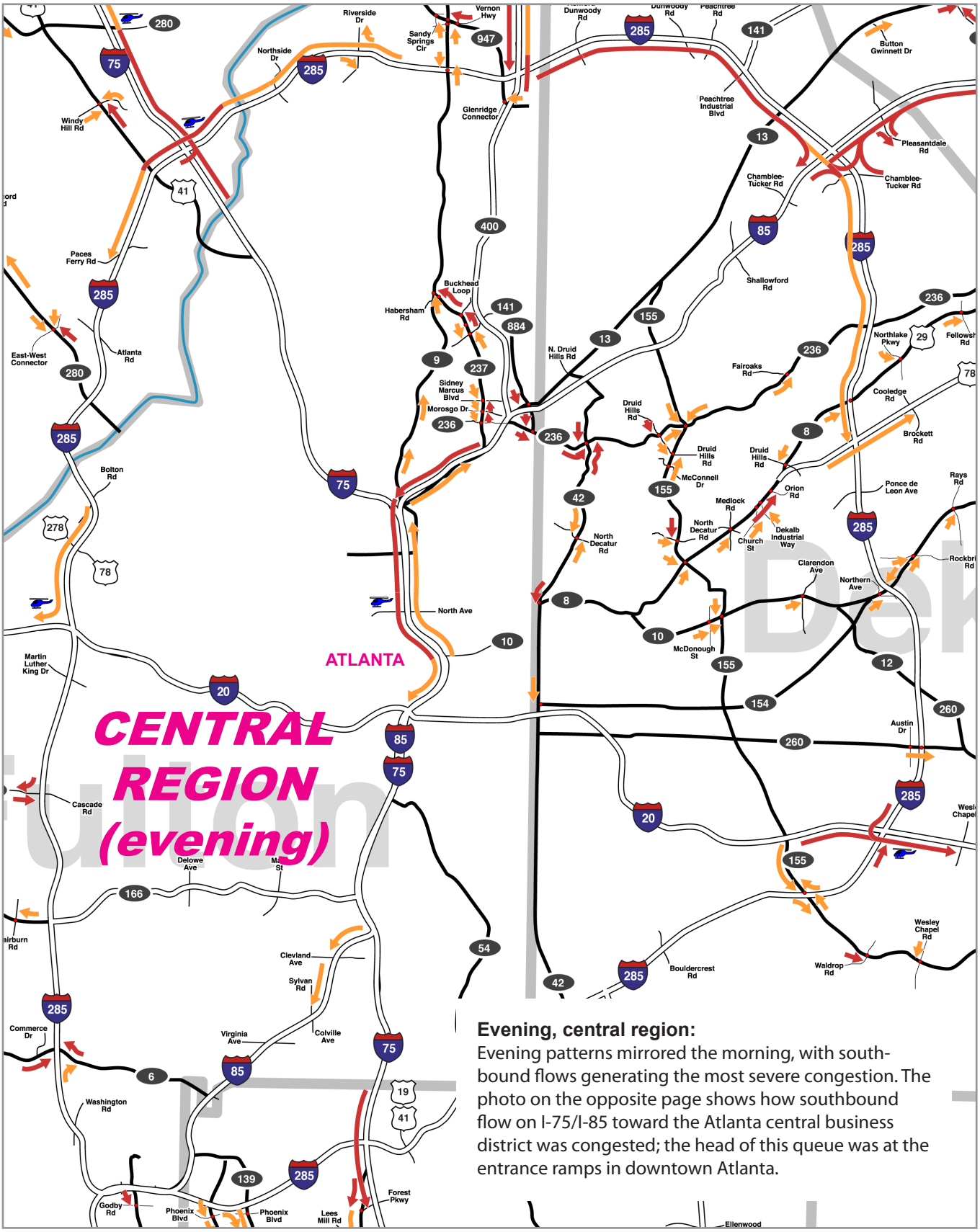


Morning to the west:
The I-20 corridor was severely congested approaching Six Flags Pkwy and the Chattahoochee River. Arterial bottlenecks were found on SR 92 and SR 6, also approaching the Chattahoochee River. Intermittent delays were found on each of the arterial corridors approaching I-285.

Photo:
Southbound congestion on SR 6 approaching the signal at Lower River Rd just north of the river crossing.



2005 Evening Bottleneck Maps



Evening, central region:
Evening patterns mirrored the morning, with southbound flows generating the most severe congestion. The photo on the opposite page shows how southbound flow on I-75/I-85 toward the Atlanta central business district was congested; the head of this queue was at the entrance ramps in downtown Atlanta.

Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

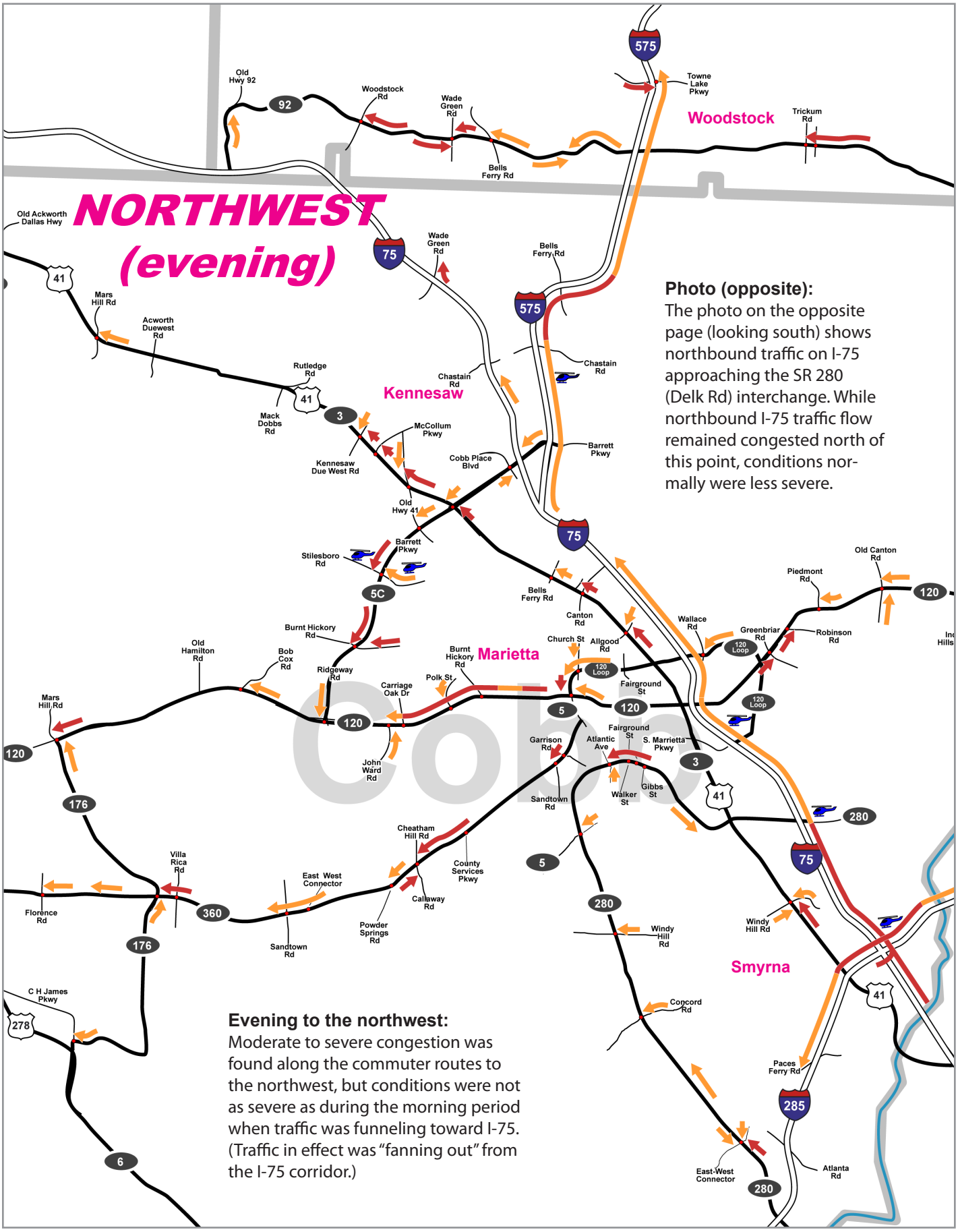


Photo (opposite):
The photo on the opposite page (looking south) shows northbound traffic on I-75 approaching the SR 280 (Delk Rd) interchange. While northbound I-75 traffic flow remained congested north of this point, conditions normally were less severe.

Evening to the northwest:
Moderate to severe congestion was found along the commuter routes to the northwest, but conditions were not as severe as during the morning period when traffic was funneling toward I-75. (Traffic in effect was "fanning out" from the I-75 corridor.)

Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

Evening to the northeast:
Radial outbound congestion along I-85, SR 141 and SR 400 was found to the north and northeast, the reverse of morning conditions. Parallel congestion was also found at many signals on SR 9 through Roswell, and on SR 13 and SR 8. Moderate to severe arterial congestion was found on all of the approaches to the Chattahoochee River bridges. Congestion was also found along the suburb-to-suburb arterials, although some of this demand was probably distribution of radial traffic. Traffic signals on outlying arterials near Lake Lanier and south toward Lawrenceville also generated significant delays, particularly SR 20. In the inbound direction, severe congestion was also found along SR 400 through Alpharetta and Roswell.

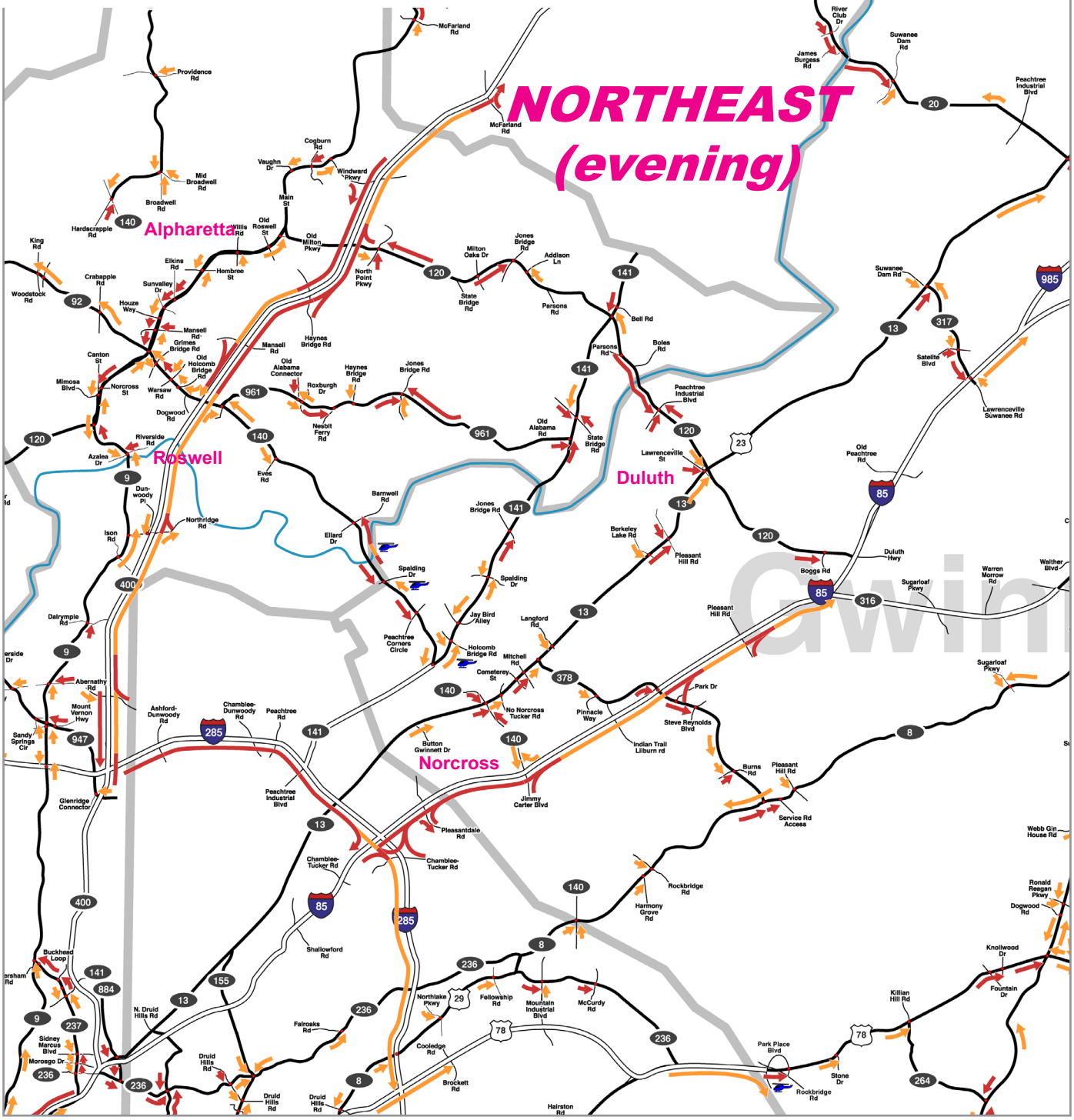
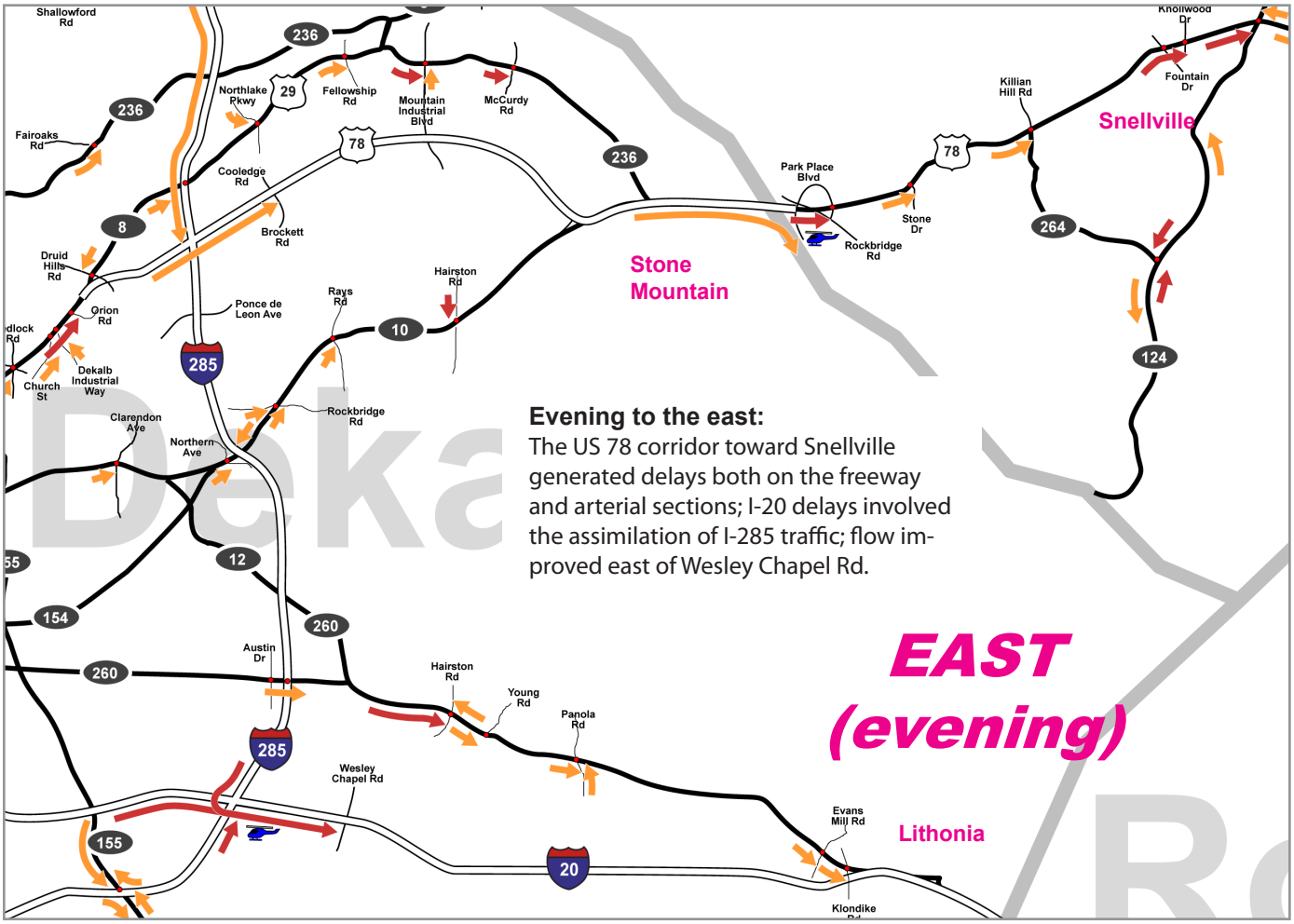


Photo:
Westbound congestion is shown on SR 140 across the Chattahoochee River; in this case, the bottleneck was not funneling toward the bridge, as usually was the case; instead the capacity constraint was the signalized intersection at Barnwell Rd.


Shallowford Rd
236
Northlake Pkwy
29
Fellowship Rd
Mountain Industrial Blvd
McCurdy Rd
Fairoaks Rd
Cooledge Rd
78
Brockett Rd
8
Druid Hills Rd
Orion Rd
Ponce de Leon Ave
Rays Rd
Hairston Rd
10
285
Church St
Dekalb Industrial Way
Clarendon Ave
Northern Ave
Rockbridge Rd
12
154
260
Austin Dr
Young Rd
Panola Rd
Wesley Chapel Rd
155
20
Evans Mill Rd
Lithonia
Klondike
Park Place Blvd
Stone Dr
Rockbridge Rd
Stone Mountain
Killian Hill Rd
Knollwood Dr
Fountain Dr
Snellville
264
124
Evening to the east:
The US 78 corridor toward Snellville generated delays both on the freeway and arterial sections; I-20 delays involved the assimilation of I-285 traffic; flow improved east of Wesley Chapel Rd.
EAST (evening)

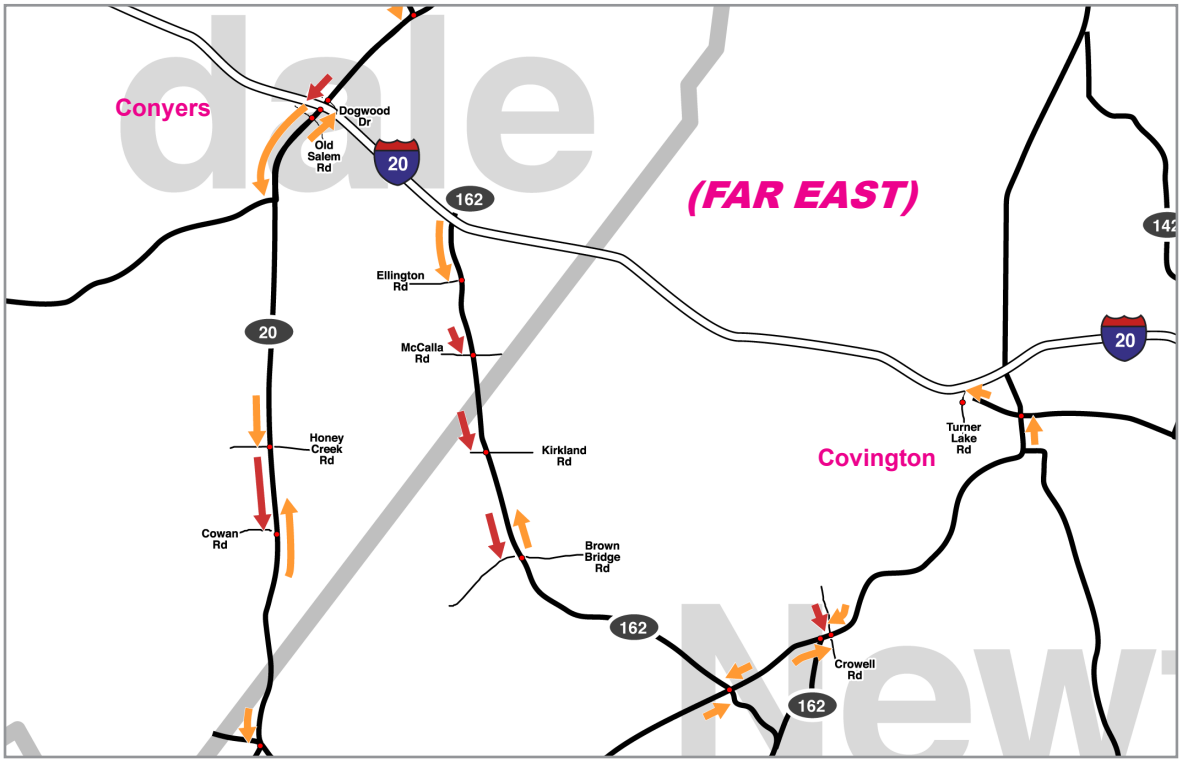

Conyers
Dogwood Dr
Old Salem Rd
20
162
(FAR EAST)
Ellington Rd
McCalla Rd
Honey Creek Rd
Kirkland Rd
Cowan Rd
Brown Bridge Rd
Turner Lake Rd
Covington
Crowell Rd

Photo:
Evening eastbound congestion is shown on I-20 between I-285 (the Perimeter) and Wesley Chapel Rd. This condition was primarily caused by the merging of three lanes of I-285 traffic onto I-20 (a lane shift for reconstruction of the Wesley Chapel Rd interchange was not the underlying cause of this perennial bottleneck).

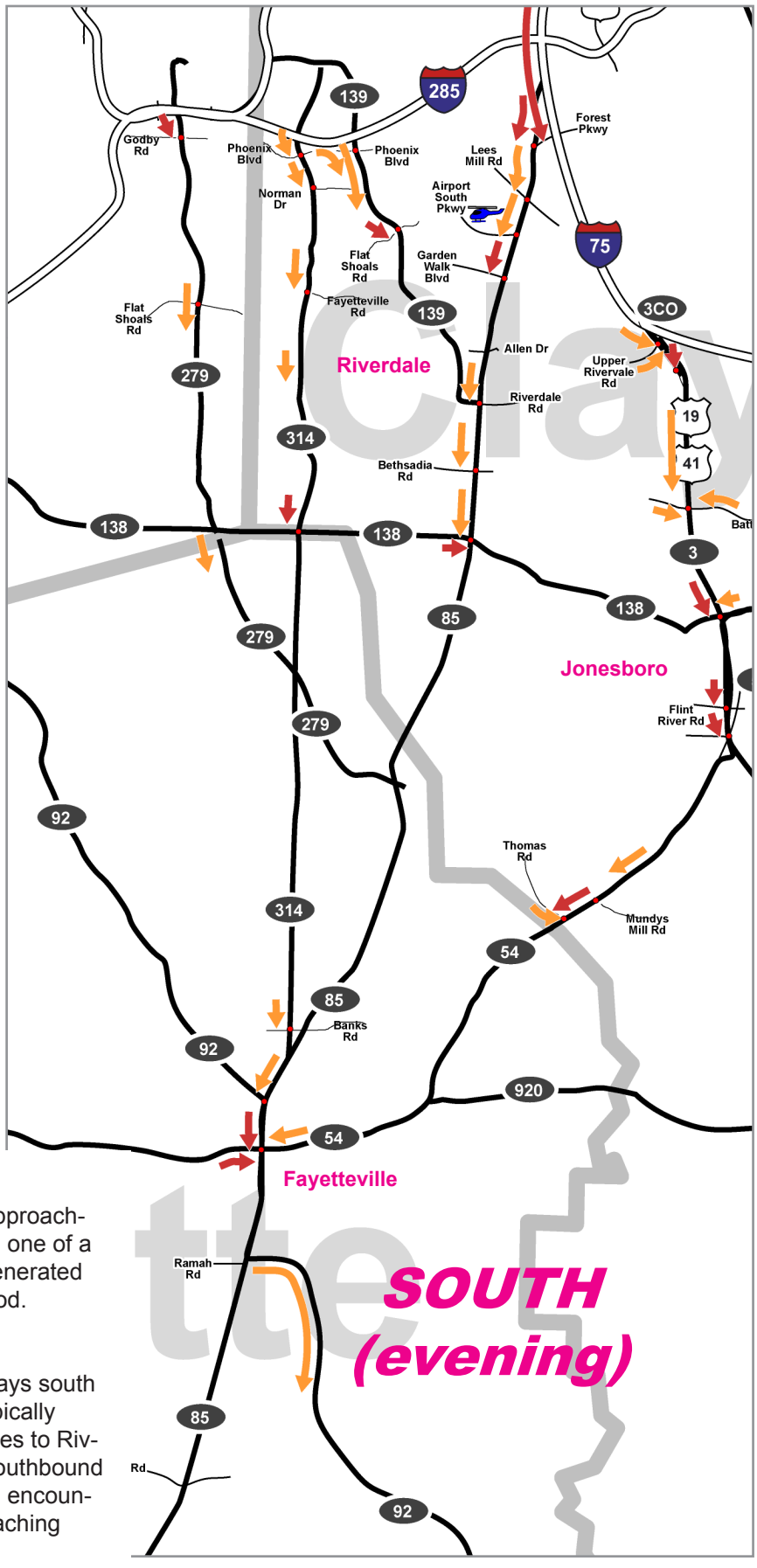
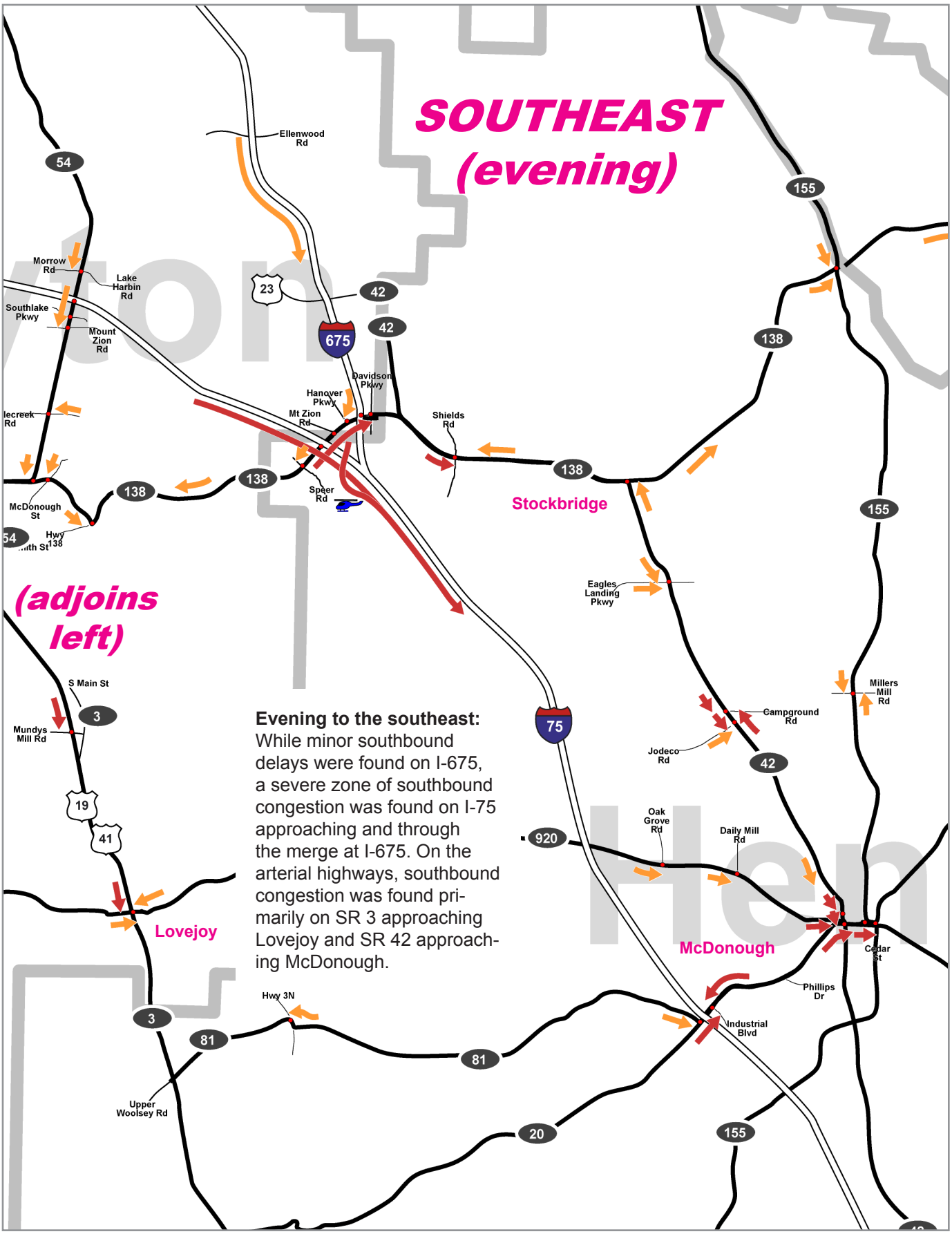
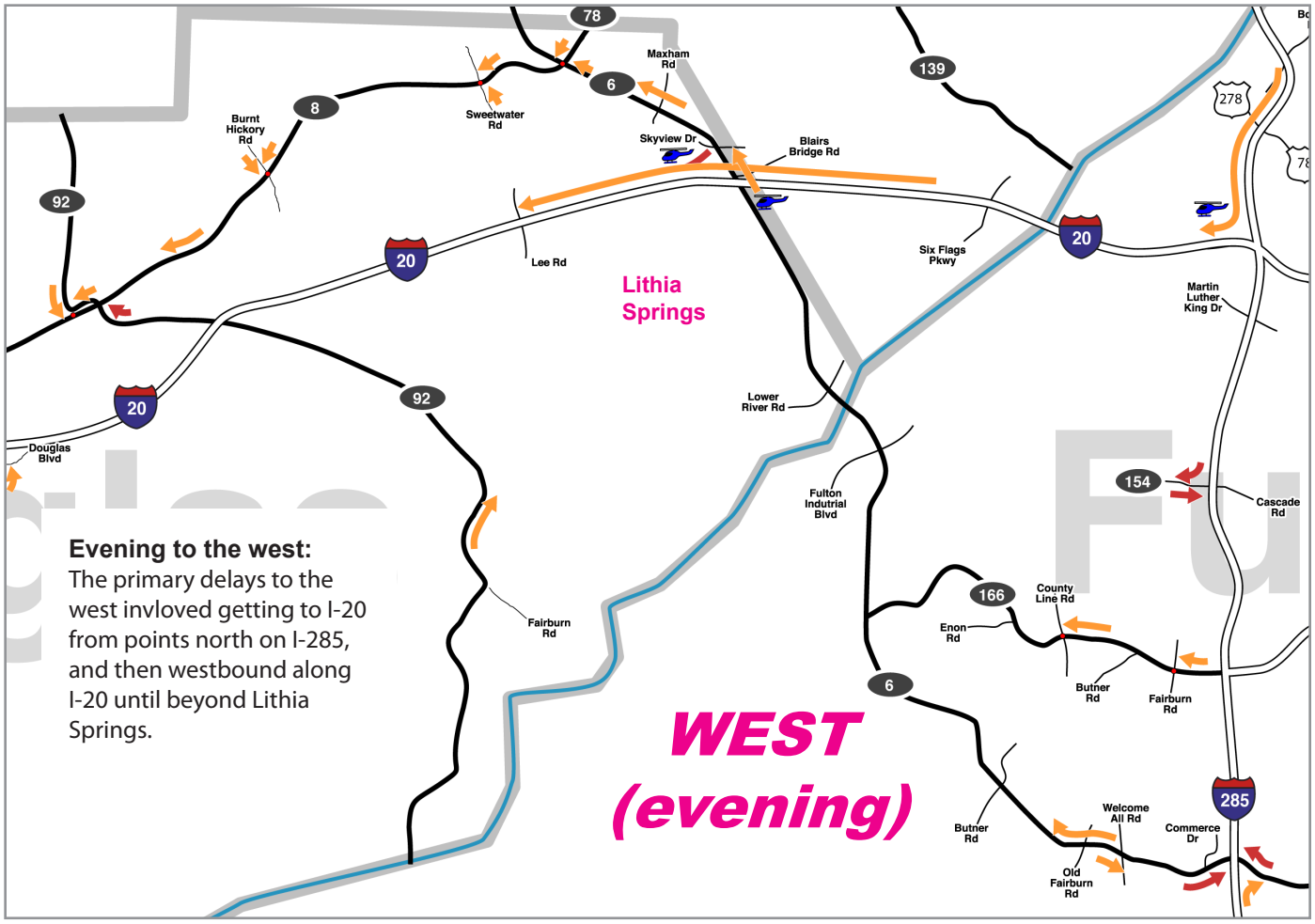


Photo:
Southbound congestion is shown on SR 85 approaching the signal at Airport South Parkway; this is one of a series of signals located south of I-285 that generated congestion during the evening commuter period.

Evening to the south:
The primary movements on the arterial highways south of I-285 were to the south; congestion was typically found at the series of signals on the approaches to Riverdale and Jonesboro. South of Jonesboro, southbound travelers proceeded with little or no delay until encountering congestion on SR 54 and SR 85 approaching Fayetteville.



Evening to the southeast: While minor southbound delays were found on I-675, a severe zone of southbound congestion was found on I-75 approaching and through the merge at I-675. On the arterial highways, southbound congestion was found primarily on SR 3 approaching Lovejoy and SR 42 approaching McDonough.


78
Maxham Rd
6
8
Sweetwater Rd
Burnt Hickory Rd
92
Skyview Dr
Blairs Bridge Rd
139
278
20
Lee Rd
Lithia Springs
Six Flags Pkwy
Martin Luther King Dr
20
92
Lower River Rd
Douglas Blvd
Fulton Industrial Blvd
154
Cascade Rd
Fairburn Rd
166
County Line Rd
Enon Rd
Butner Rd
Fairburn Rd
6
WEST (evening)
285
Welcome All Rd
Commerce Dr
Butner Rd
Old Fairburn Rd
Evening to the west:
The primary delays to the west invloved getting to I-20 from points north on I-285, and then westbound along I-20 until beyond Lithia Springs.


(FAR SOUTHWEST)
14
74
Dogwood Trail
154
85
Newnan
74
70
Peachtree City
Old State Hwy 34
34
Line Creek Dr
Market Place Blvd
34 Bypass
Dixon St
14
34
Lakeside Way
Huddleston Rd
Planterra Way
Kelly Dr
Bonnell St
154

Photo:
Westbound congestion is shown on I-20 approaching SR 6 (Thornton Rd). Congestion appeared to be caused by two factors: 1) the lane drop (4 lanes to 3) at SR 6 (Thornton Rd); and 2) traffic entering at SR 6.

PART TWO

Bottleneck Changes on the Extended Primary Network, 2005 vs. 2001

This section highlights the changes found on the extended primary network over recent years, between 2001/2002 and 2005. (For clarity, the "extended primary network" includes the freeway system and a few selected signalized arterial highways; however, it does not include the larger arterial network surveyed first in 2004 (see maps at the beginning of this report for network definitions).

This section of the report will begin with a discussion of the general nature of how mobility and congestion changes (and adjusts) in major metropolitan areas. General trends in the Atlanta metro area will be discussed next. That will be followed with specific examples of significant differences found during 2001 and 2005 survey periods.

This section will conclude with morning and evening region-wide "comparative maps". These are actually converted bottleneck maps from the most recent survey period, modified so that bright colors are only used to highlight changes. Thus, if an arrow represents degraded conditions, it remains its original red or orange color. If it represents less severe congestion, it remains orange but a green border is added to depict the improvement. Where a former arrow is gone because congestion no longer was found, a green arrow is added to mark the location and extent of the improvement. All other arrows -- meaning those that do not represent significant change -- are de- emphasized by changing their red and orange colors to black and gray. Once a bottleneck map has been completely converted to a comparison map, the viewer's eyes are drawn by the colors only to locations where significant changes have occurred.

Project "toolkit" for public agencies to alleviate bottlenecks and maintain mobility:

Types of highway infrastructure improvements

Build new highways, bypasses, or extensions
Convert signalized routes to freeways
Widen pavement / add lanes
Create HOV or other restricted-use lanes
Realign / relocate sections
Change use of existing pavement (restripe)
Add direct connectors
Add passing or auxilary lanes (widen or restripe)
Improve shoulder clearance and sight distance
Add turning lanes along medians or at intersections
Install ramp meters
Upgrade & re-time signals / add sensors & actuators
Broaden sharp turns; regrade
Clarify sign messages and improve sign placement
Add or remove highway access points / interchanges
Add or close ramps at interchanges
Lengthen weaving zones or accel. / deceleration lanes
Add sensors to collect flow data
Add variable message signs

Types of operational improvements

Add service patrols to aid stopped vehicles
Improve signal control algorithms
Provide better information to drivers in real-time

Demand management initiatives

Provide incentives for transit use & ride sharing
Expand transit service and options
Expand bicycle and pedestrian facilities
Promote tele-commuting

The balanced nature of highway mobility and congestion in large metroplitan areas

The daily level of congestion on any regional highway network can be viewed as an optimization of the system by the motoring public; it essentially reflects a balance between the limitations of the network and the needs or desires of the users. A large percentage of users have flexibility regarding the timing of their trips, and by exercising that flexibility, serve to maintain this balance from week to week and month to month. Over long time periods, however, the pressures of economic and population expansion or geographic relocation cause congestion to spread on the system. Regional transportation agencies are responsible to combat this spread with initiatives to improve the efficiency of the network, expand its capacity where advisable and feasible, and discourage overuse by programs to influence the behavior of drivers (see "Project Toolkit" to the left).

For specific congestion-mitigation investments, short-term success can be documented by showing that congestion no longer forms, or occurs at less-severe levels. However, many improvements can be quickly absorbed by driver behavior changes: for example, when word gets out that a particular route is now less congested, drivers may shift their

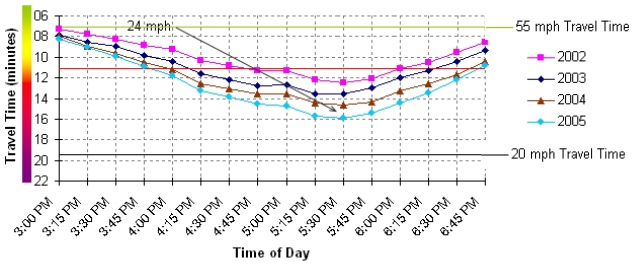
routes or timing in numbers that are high enough to restore the congestion. Nevertheless, even if the improvement at a project site is only evident for a short period of time, pressure has been relieved somewhere on the system, and the traveling public has benefited. That is not to say, however, that visible progress against the spread of congestion cannot be made: some bottlenecks are so inefficient that correcting them can lead to mobility benefits that are evident for years, despite driver behavior shifts and long-term growth.

Trends in the Atlanta-centered planning region

Despite investments made by governmental agencies, mobility degradation remains a reality in the Atlanta metropolitan area. Most charts from the Georgia Navigator historical database of freeway travel times show annual decreases in average travel speeds between key points (see chart to the right). This trend is also supported across the larger network by aggregated data from this survey program. The aerial survey program directly measures traffic flow quality on every surveyed highway link of over 2,000 miles of highway, by direction, and provides one (average) level-of-service performance rating for each surveyed hour (from 6:30 to 9:30 a.m. and from 4:00 to 7:00 p.m.). Thus, for each year surveyed, it is simple to list how many lane-miles of highway were operating at each LOS value for each of the six peak hours, add the numbers together, and then compare the totals between survey years to see how conditions have been changing. The results of such an analysis are shown in the pie charts to the right. The top pie chart shows the combined results of the 2001/2002 survey of the freeway system (most were done in 2001, while the outlying freeway sections were added in 2002). The bottom pie chart shows the 2005 survey results, when the entire freeway system was surveyed. The top chart shows that 7% of the freeway lane-miles were operating under congested conditions (LOS F) in 2001/2002 during peak commute hours; by 2005, that number had climbed to 10.5% (red pie slices). With regard to heavy but fast-moving traffic flow at volumes near capacity (LOS E), the percentages were 5% in 2001/2002 and 6% in 2005 (orange pie slices). With regard to lightly-traveled segments (mostly in the outlying counties or off-peak directions, LOS A and LOS B dropped from 60% of the system in 2001/2002 to 50% in 2005 (light green in the two pie charts).

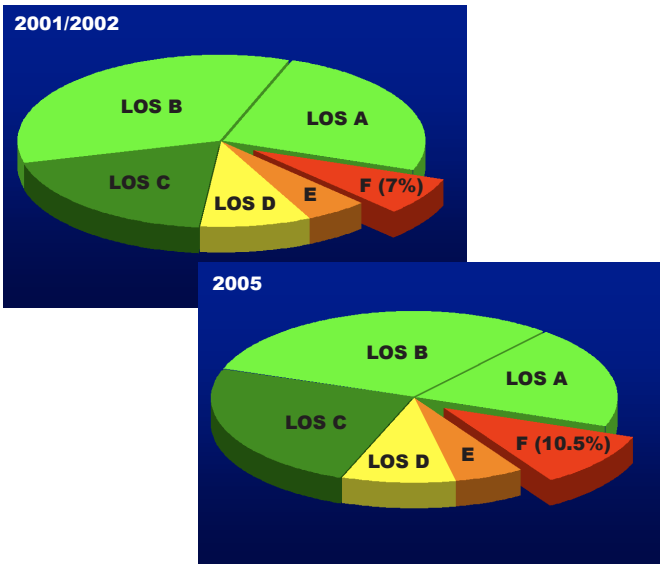
Comparative maps presented later in Part Two reveal geographical insights about the general nature of recent changes on the regional Atlanta system. While evidence is seen in the maps of the growth of suburb-to-suburb congestion in some areas, newly congested or degraded freeway miles were primarily found along Atlanta-centered radials; this is consistent with historical patterns of increasing inbound congestion during morning periods and increasing outbound congestion during evening pe-

Georgia Navigator historical database example



Georgia Navigator historical trend, I-285 EB (from SR 400 to I-85): There are four data curves in this chart; the dip in each curve represents delay due to recurring congestion; the bottom of each curve represents the lowest average speed (highest travel time) for an average day in a specific year. In order from top to bottom, the curves represent 2002, 2003, 2004 and 2005; thus these curves show that congestion has gradually increased along this segment each year. The Navigator system produces historical charts for each of the 32 links that it monitors; most of these curves show similar decreases in mobility.

Aerial survey LOS splits for freeways, 2001/2002 vs. 2005



Aggregated aerial survey level-of-service (LOS) splits from the freeway system, 2001/2002 (top) and 2005 (bottom): Each colored pie slice represents the percentage of lane-miles operating at each LOS value for one hour during survey periods. This shows that the direct measurement of traffic densities using aerial photography confirms that congestion has been spreading on the system.

riods. The most severely degraded freeways were in the northern counties in the morning, for commuters traveling inbound along I-75, I-575, I-85, and SR 400. These same routes also saw increased outbound congestion during the evening period, although not as densely congested. I-20 (to the east and west) and I-75 (to the south) also experienced significantly increased congestion during both morning and evening survey periods, although generally not as severely as in the north. I-85 to the southwest was the only major radial interstate highway that did not record congestion, during either the morning or evening survey periods. With regard to increased congestion in the non-peak direction, SR 400 was the only place where new delays of that type were found at significant levels.

On the arterial highways included in the primary network, increased corridor congestion during the morning period was found on eastbound SR 120 approaching Marietta and Kennesaw; and on southbound SR 3 / US 41 paralleling newly-congested parts of I-75 (also approaching Kennesaw). Newly-congested signals were also found on eastbound SR 92 approaching Woodstock and Roswell, and SR 120 again traveling from Marietta toward Roswell.

Minor intermittent queues were found more often on eastbound SR 6 between the Chattahoochee River and I-285; likewise, minor northbound degradations were also evident on the primary arterials from the south (SR 85 and US 19 / 41).

LEGEND FOR COMPARATIVE MAPS

Current Traffic Conditions:	2. Legend for Comparative Maps ('01 vs '05):
CONGESTED:	Degraded Unchanged
MARGINALLY CONGESTED:	Degraded Unchanged Improved
NOT CONGESTED:	(No Arrow) Unchanged; Improved

On comparative maps, black and gray show congestion that has not changed significantly; colors are reserved to highlight changes (degraded or improved conditions).

Mobility improvement and degradation:

The next section of Part Two presents each of the most significant improvements and degradations found on the freeway system between 2001/02 and 2005. Please note that where changes were found, some such changes could be temporary as the traveling public shifts its behavior to rebalance the system (see discussion above). These presentations will introduce comparative arrowhead maps: these were derived from the bottleneck maps already presented, but colors have been retained only to show where significant changes have occurred. Otherwise, red and orange colors have been replaced with black and gray (respectively).

FREEWAY SITES (in order on the following pages):

Documented freeway improvements, 2001 vs. 2005:

1. Evening site 1: southbound I-285 approaching US 78 / Stone Mountain Freeway, p. 37;
2. Evening site 2: southbound I-75/I-85 approaching SR 10 / Freedom Parkway, p. 38.

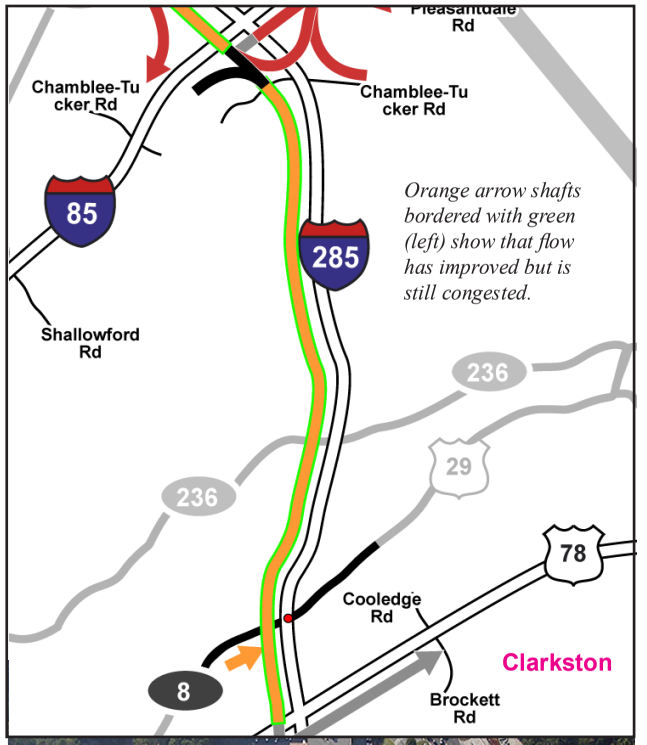
Documented freeway degradations, 2001 vs. 2005:

1. Morning site 1: southbound I-75 and I-575 in Cobb and Cherokee Counties, p. 39;
2. Morning site 2: eastbound I-20 in Douglas County, p. 40;
3. Morning site 3: westbound I-20 in DeKalb County, p. 41;
4. Morning site 4: northbound and southbound SR 400 in Gwinnet County, p. 42;
5. Morning site 5: southbound I-85 in Gwinnet County, p. 43;
6. Morning site 6: westbound I-285 in DeKalb County, p. 44;
7. Morning site 7: northbound I-75 in Henry County, p. 45
8. Evening site 1: northbound I-575 in Cobb and Cherokee Counties, p. 46;
9. Evening site 2: southbound I-75 in Clayton County, p. 47;
10. Evening site 3: southbound I-75 from Clayton into Henry County, p. 48;
11. Evening site 4: northbound I-85 from DeKalb into Gwinnet County, p.49.
12. Evening site 5: eastbound US 78 from DeKalb into Gwinnet County, p. 50;
13. Evening site 6: northbound SR 400 from Fulton into Forsyth County, p. 51.

INTERSTATE IMPROVEMENT: Southbound I-285 between I-85 and US 78 in Dekalb County, EVENING SITE 1

On the 2005 survey dates, congested southbound traffic on I-285 flowed at lower densities and higher average speeds than on 2001 survey dates. This apparent improvement was minor enough that it simply may have resulted from ordinary day-to-day variations along a volatile corridor (the aerial surveys constitute a four-day average "snap-shot", which sometimes will reflect these variations). Whatever the reality, it seems likely that a downstream project at SR 8 and US 78 provided some level of benefit. The project involved adding an auxiliary weaving lane between those two interchanges, and widening the exit ramp to eastbound US 78 from one to two lanes. Completed in 2003, this provided a 5th lane for the one-mile link between a heavy merge (SR 8) and a heavy exit ramp (US 78).

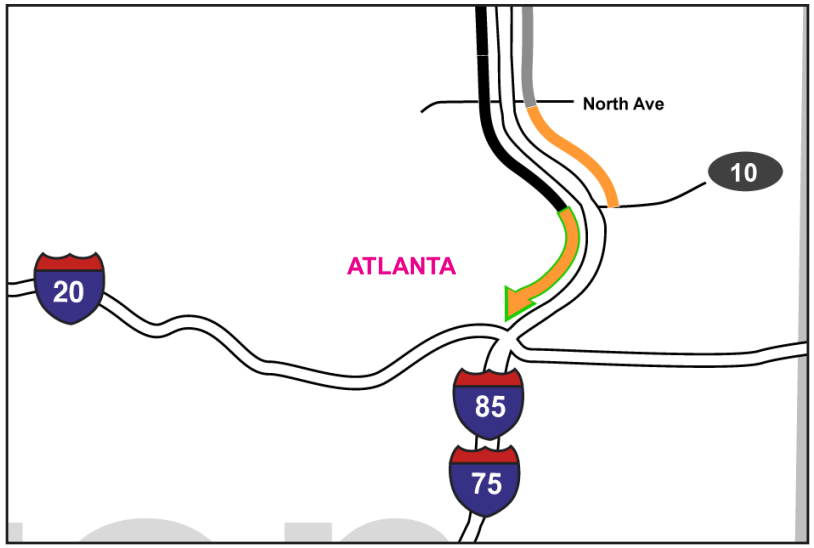
The photos below show relatively loose southbound traffic flow (right to left) through the widened zone, and the relatively uninhibited discharge of vehicles from the upstream queue (arriving from the right). In that 5.5 mile queue from Chamblee-Tucker Road, densities in 2001 were measured in the 50's, 60's and 70's compare to 2005 measurements in the 40's, 50's and 60's (in units of passenger cars per lane per mile). Density differences of that magnitude correspond to 5-10 mph average speed differences.



HALF-MILE REMOVED

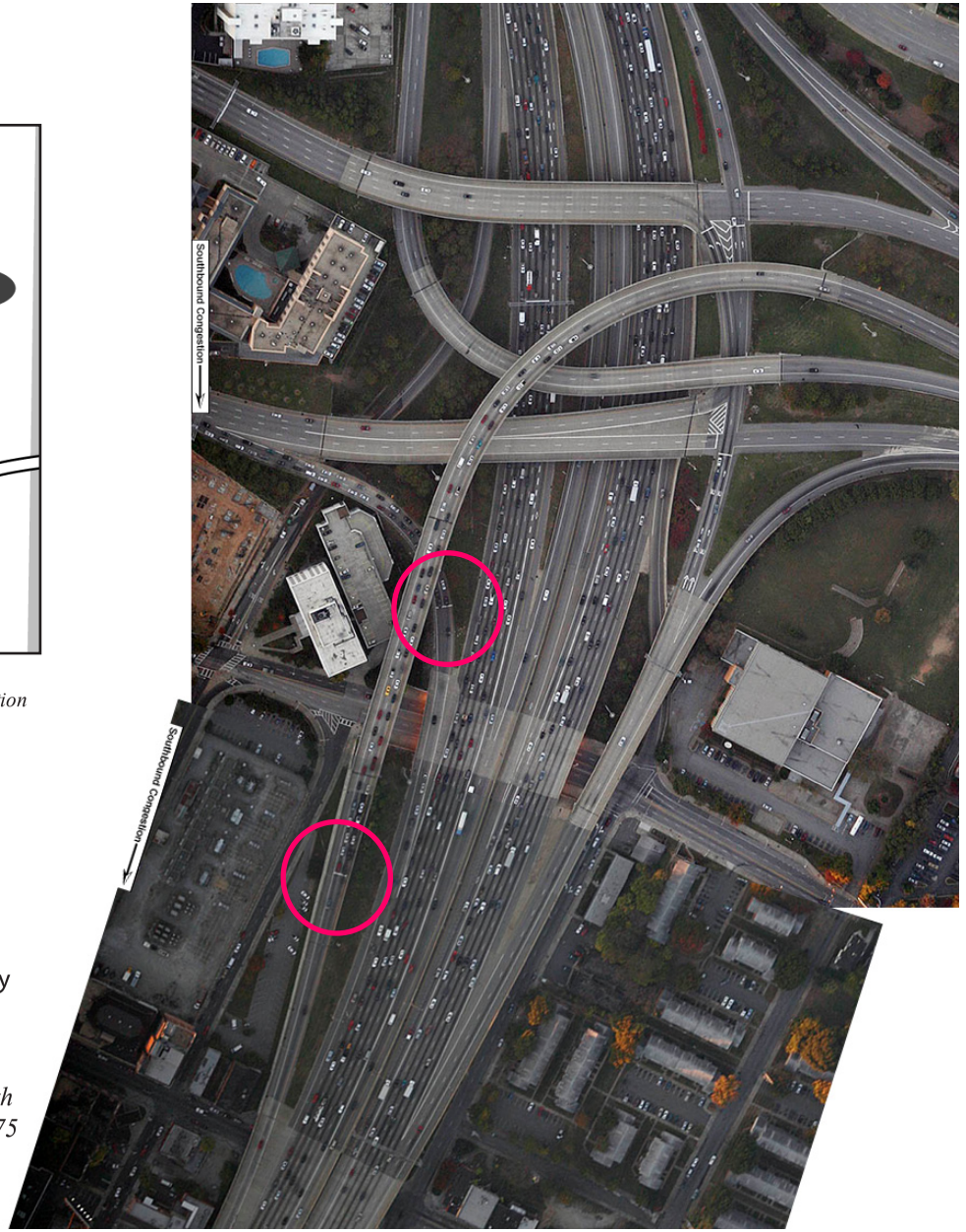
Southbound flow on I-285 is to the left. Circles show where highway was widened to 5 lanes approaching US 78, and the widened 2-lane ramp to US 78; SR 8 is to the right. (2005)

INTERSTATE IMPROVEMENT:
Southbound I75/85 departing the Atlanta central business district, EVENING SITE 2



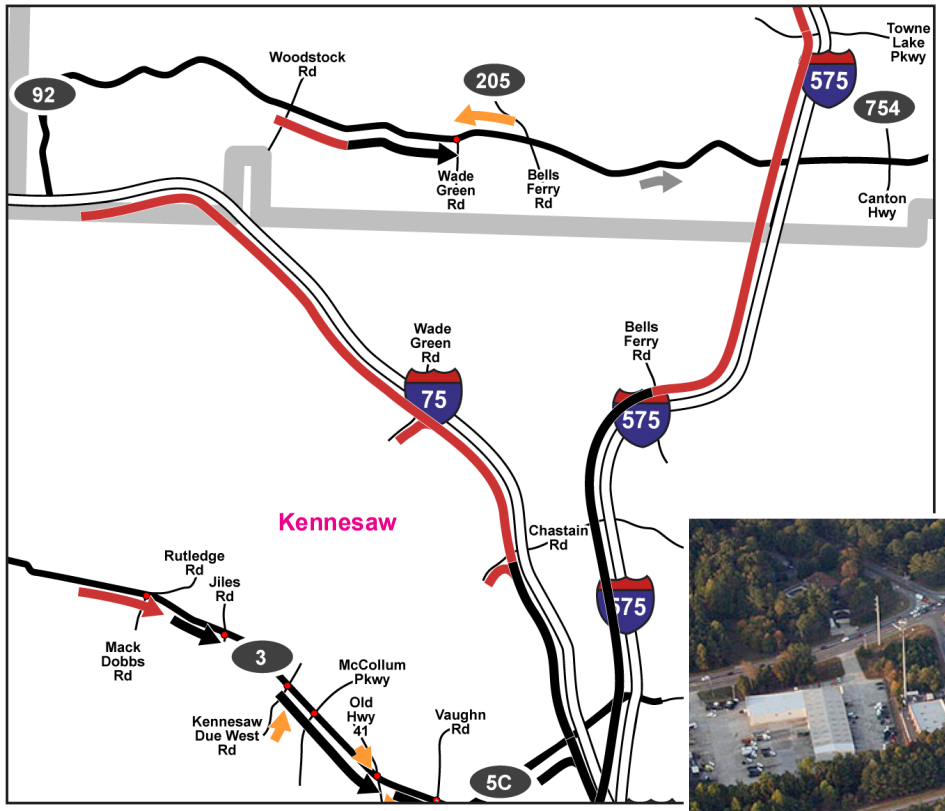
Arrow shaft colors: red & orange show degradation in 2005; black & gray show congestion unchanged; green shows improvement.

On southbound I-75 / I-85 through the downtown CBD, the installation of ramp meters on four entrance ramps (Spring St, Freedom Parkway (SR 10) / eastbound and westbound, and Edgewood Ave) may help to explain slightly improved flow toward the I-20 interchange. While severe congestion was still found upstream, in 2005 traffic densities beyond Freedom Parkway to I-20 measured slightly lower, indicating a minor increase in average travel speeds.



RIGHT: This photo is oriented with north to the top. Southbound congestion on I-75 / I-85 is shown on the left side, at SR 10 (Freedom Parkway). The two metered ramps from SR 10 are circled. (2005)

Morning Site 1: FREEWAY DEGRADATION: Southbound I-75 and I-575 in Cobb and Cherokee Counties vicinity Kennesaw and Woodstock (MORNING):



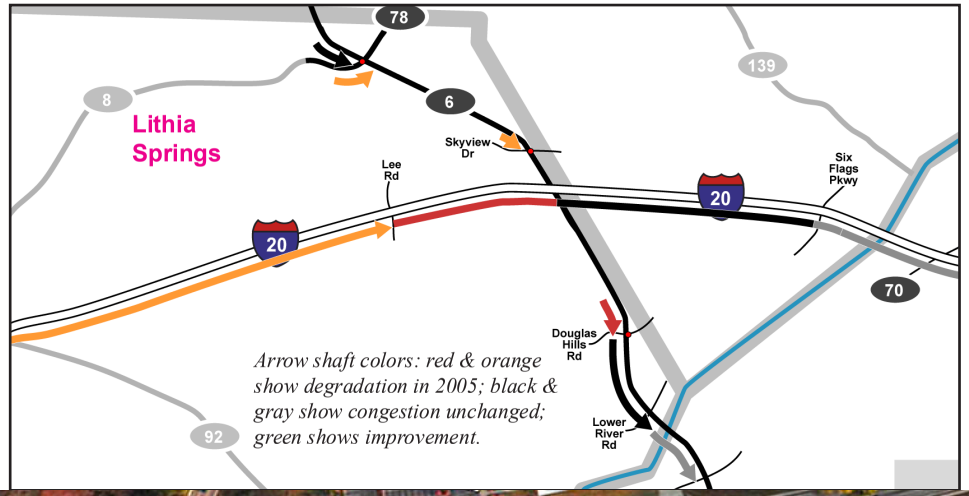
Arrow shaft colors: red & orange show degradation in 2005; black & gray show congestion unchanged; green shows improvement.

When first surveyed in 1998, the I-75 / I-575 southbound traffic generated congestion starting at a point south of Chastain Road. In 2001, congestion was encountered sooner, near Wade Green Rd on I-75 and Bells Ferry Rd on I-575. There were also several samples in 2001 where congestion was encountered well to the north, shortly after crossing SR 92; however, this was not usually the case, unlike the conditions found in 2005. During the new survey, this zone of congestion was usually encountered in the vicinity of the SR 92 interchanges (on both interstates). Vehicle densities in these areas were high, indicating average stop-and-go travel speeds in the range of 15 to 25 mph.

I-75 at Wade Green Road in 2005. Conditions were free-flow here in 2001.

Morning Site 2: FREEWAY DEGRADATION: Eastbound I-20 in Douglas County vicinity Lithia Springs (MORNING):

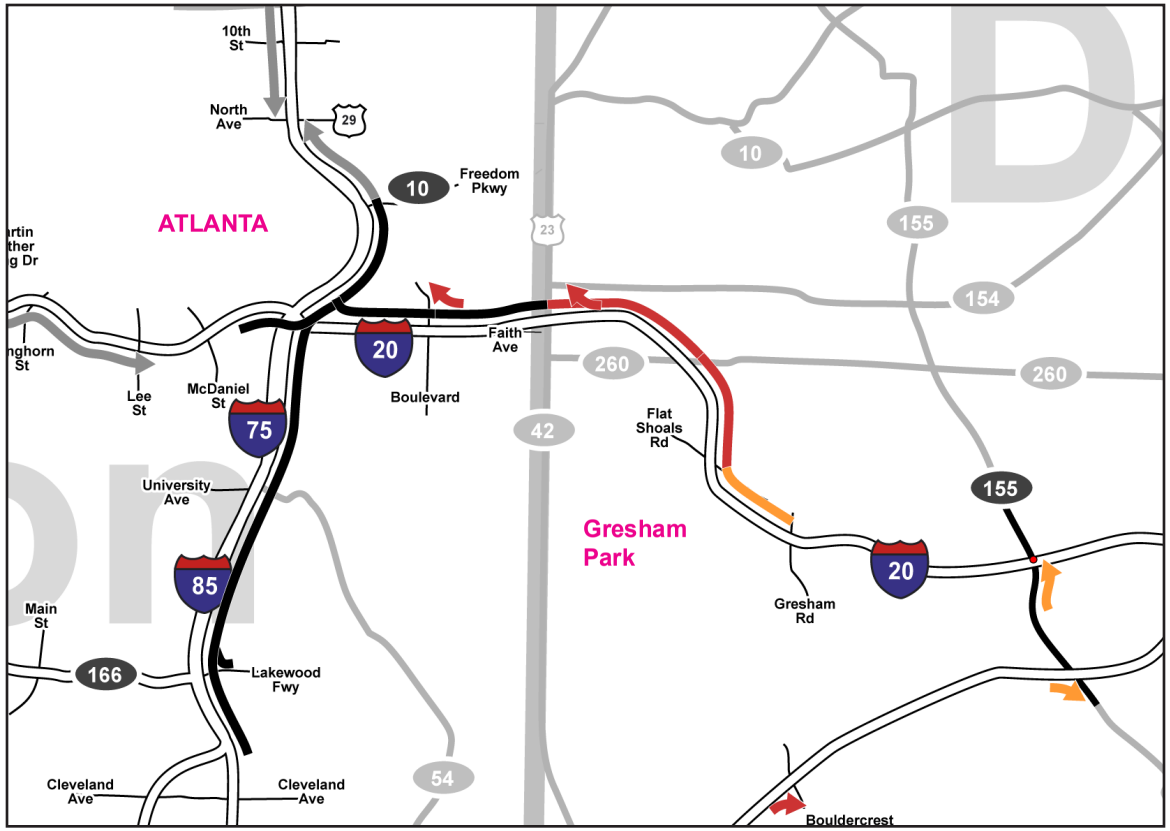
Eastbound congestion on I-20 into Cobb County has historically involved stop-and-go conditions with average speeds of 20-30 mph; a primary factor has been the lane drop (4 lanes to 3) approaching Six Flags Drive. In 1998 the tail of this queue was consistently encountered at the Camp Creek Parkway interchange (SR 6); in 2001 this tail was encountered sooner, closer to Lee Road, but only on some days and not others. This trend continued in 2005, with slowing and the tail of the queue consistently being encountered prior to reaching Lee Road.



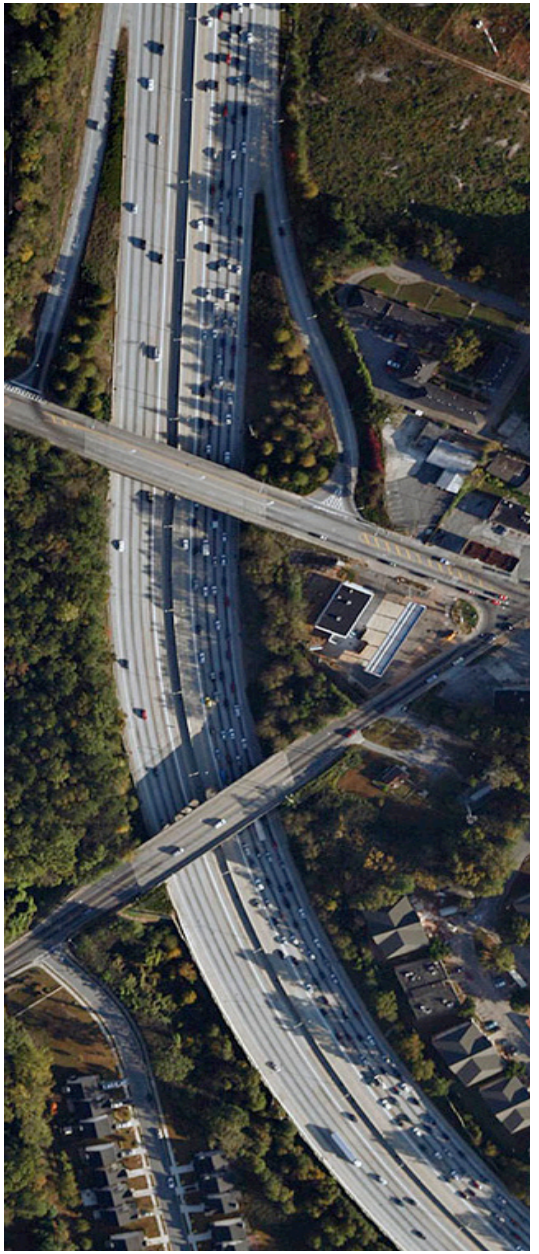
Eastbound congestion on I-20 at the drop to three lanes at Six Flags Drive (2005)

Morning Site 3: FREEWAY DEGRADATION: Westbound I-20 in DeKalb County vicinity Gresham Park (MORNING):

In 2001, westbound congestion was found on I-20 from the vicinity of SR 260 (Glenwood Ave) to the approaches to the I-75 / I-85 interchange; however, between Glenwood Ave and Moreland Ave (US 23), congestion was variable, with heavy days mixed with light days. In 2005, the tail of the queue was encountered about 1-2 miles farther upstream, typically between Gresham and Flat Shoals Roads. Conditions were also degraded from Glenwood Ave to Moreland Ave, where average densities were higher, reflecting congestion that was more consistently present on a daily basis.

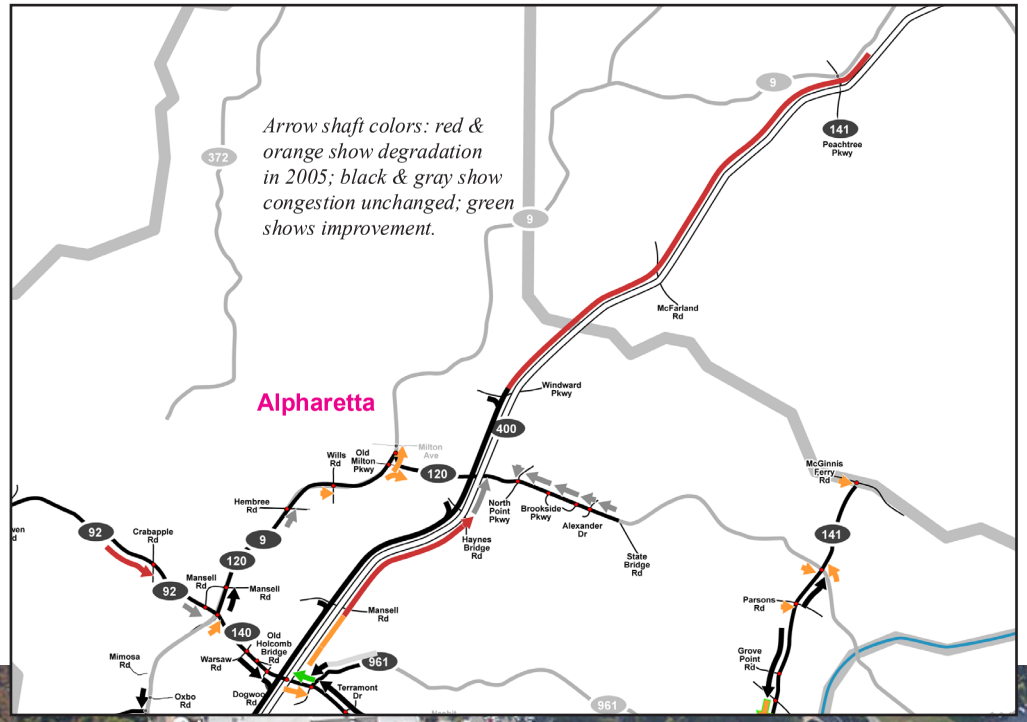


Arrow shaft colors: red & orange show degradation in 2005; black & gray show congestion unchanged; green shows improvement.



RIGHT: Westbound congestion at Flat Shoals Rd. (2005)

Morning Site 4: FREEWAY DEGRADATION: Northbound and southbound SR 400 in Forsyth and Fulton Counties (MORNING):

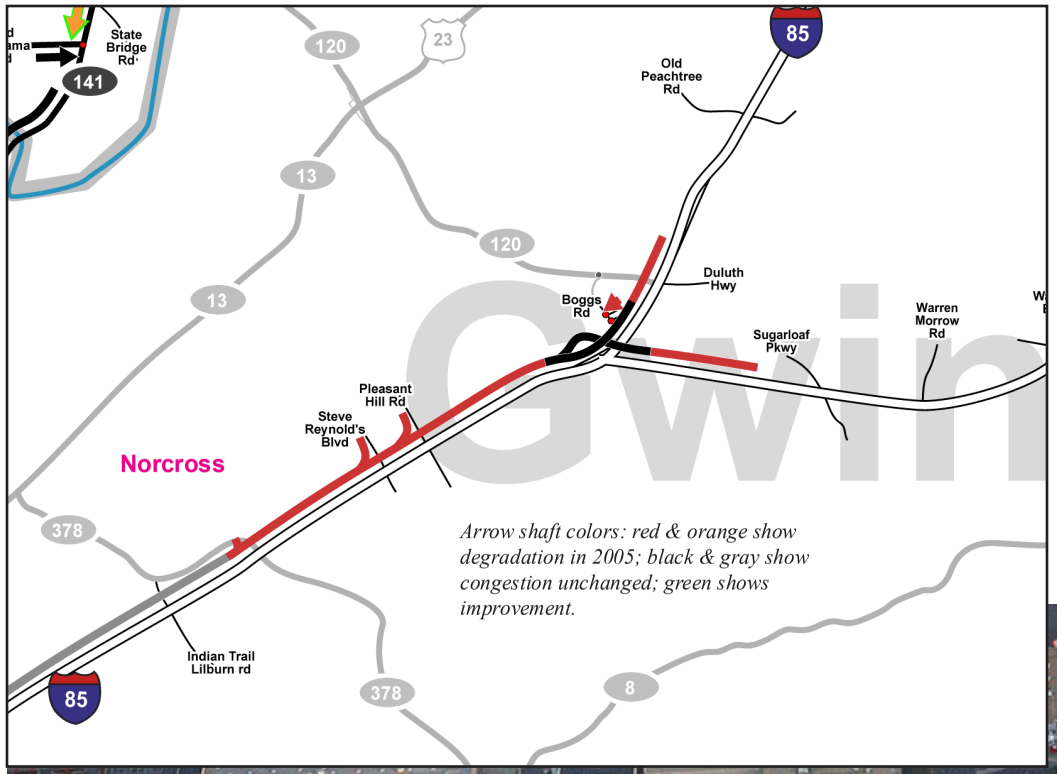


SR 400 was first surveyed north of Windward Parkway in 2002; during that period, southbound commuters were not delayed until just before Windward Parkway. When surveyed three years later, however, the congested zone extended 7 miles farther to the north, to a point between Buford Highway and Peachtree Parkway (SR 141). During the peak hour, very high traffic densities were found in this newly congested zone, with expected average speeds in the 15 to 20 mph range.

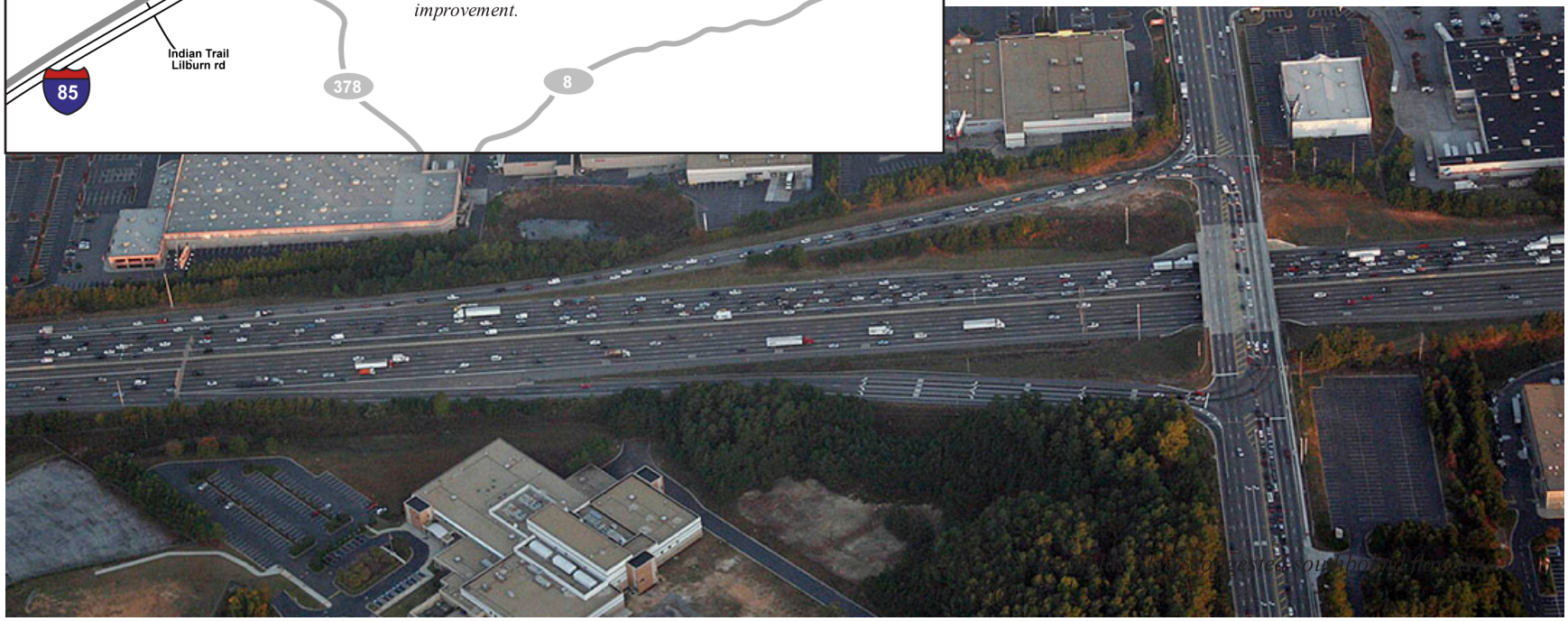
In the northbound direction, minor congestion had been found in 2001 between Mansell Rd and SR 120; a general degradation was found in 2005, with congestion beginning 1-2 miles farther south (near the Chattahoochee River and Holcomb Bridge Rd) and involving slightly slower average travel speeds (30 mph vs. 35-40 mph).

Southbound congestion on SR 400 at McFarland Road

Morning Site 5: FREEWAY DEGRADATION: Southbound I-85 in Gwinnet County vicinity Norcross (MORNING):



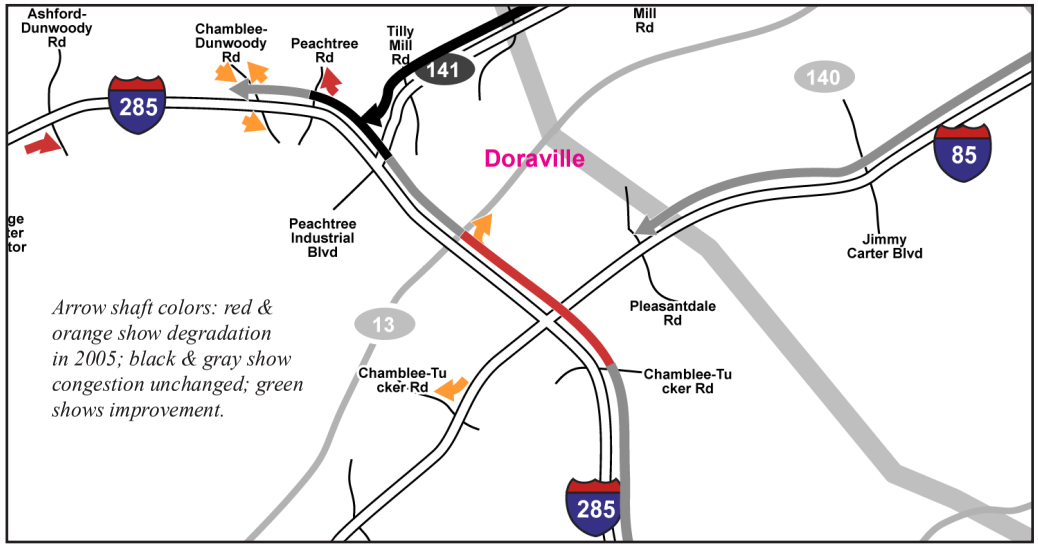
In 2005, stop-and-go southbound traffic with average speeds in the 20-30 mph range was found along I-85 from the merge at SR 316 to the vicinity of Indian Trail Road, where flow remained congested but conditions were improved. While similar congestion had been found in 2001, it was mostly found during just the first hour (6: 30 to 7:30 a.m.); in 2005, these conditions were found across all three survey hours (6: 30 to 9:30 a.m.). (Note: conditions in 2001 were better than in 1998, due to the recent completion and opening of the southbound HOV lane north of I-285).



Looking toward severe southbound flow

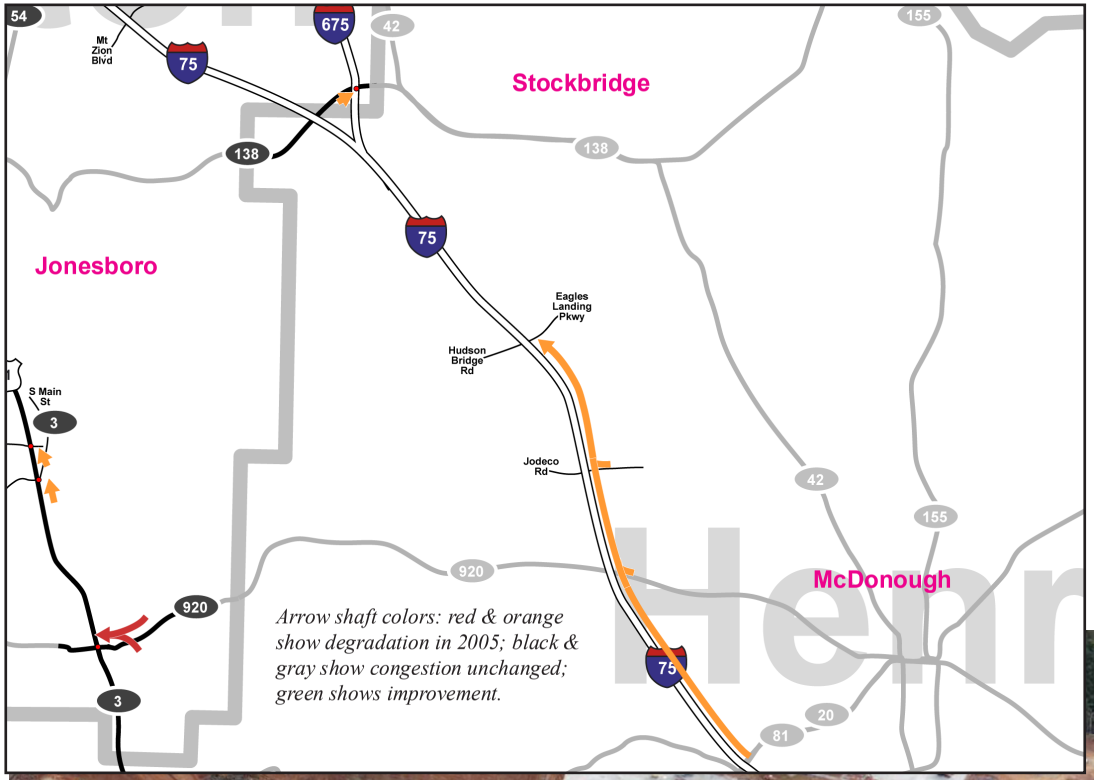
Morning Site 6: FREEWAY DEGRADATION: Westbound I-285 in DeKalb County vicinity Doraville (MORNING):

The merge of I-285 traffic with traffic from I-85, Buford Highway, SR 141, and Peachtree Rd has generated westbound congestion on I-285 during both previous survey iterations (1998 and 2001). Travel speeds through the stop-and-go congestion have historically averaged around 30 mph, with slower speeds typically found downstream approaching the Peachtree Road interchange. Prior to 2005, this congestion was not normally encountered until after passing through the I-85 interchange. However, during the 2005 survey flights, congestion was consistently encountered farther upstream, near the Chamblee-Tucker Road interchange. This congestion was also more severe than previously found, with higher densities indicating average travel speeds in the 15-25 mph range.



I-285 just west of I-85, viewed from the north; congested traffic heading to the right is westbound on I-285. (2005)

Morning Site 7: FREEWAY DEGRADATION: Northbound I-75 in Henry County vicinity McDonough (MORNING):



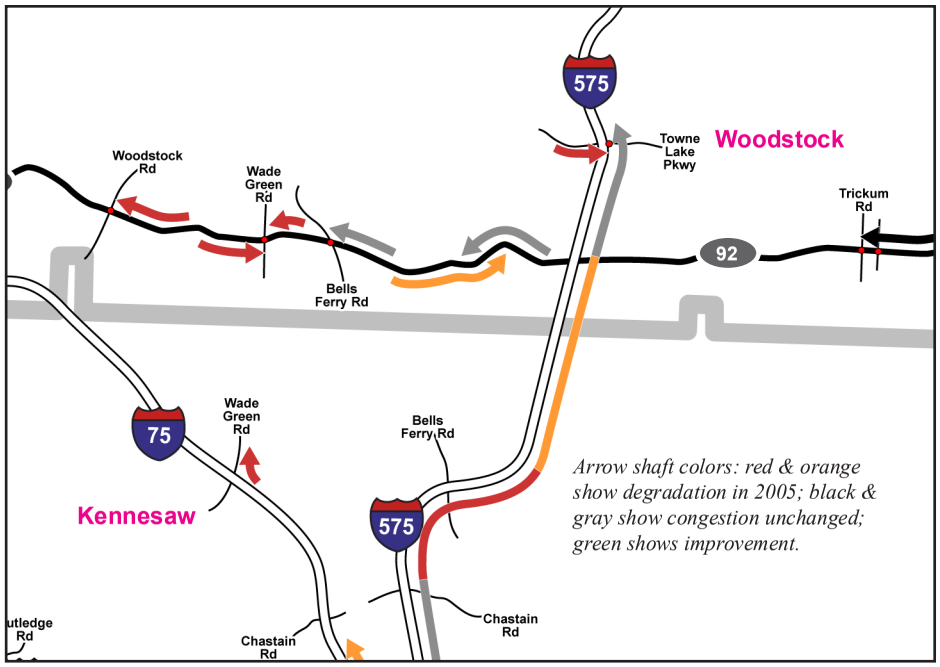
The northbound trip on I-75 through Henry County has not historically involved delays during the morning survey period, based on surveys in 1998 and 2001 (north of Jonesboro Road) and 2002 (south of Jonesboro Road). Peak LOS ratings were typically measured at the C and D levels. However, intermittent congestion with speeds in the 30 to 50 mph range were recorded during the 2005 survey flights. Merging traffic from Jonesboro and Jodeco Roads were contributing factors. While the most significant delays were found between those two interchanges, flow at reduced speeds was found intermittently along the 6-mile path between Hampton Road (SR 20) and Hudson Bridge Road.

Light to moderate congestion was found on I-75 at the Jonesboro Rd interchange; northbound flow is to the left. (2005)

Evening Site 1: FREEWAY DEGRADATION: Northbound I-575 in Cobb and Cherokee Counties vicinity Woodstock (EVENING):

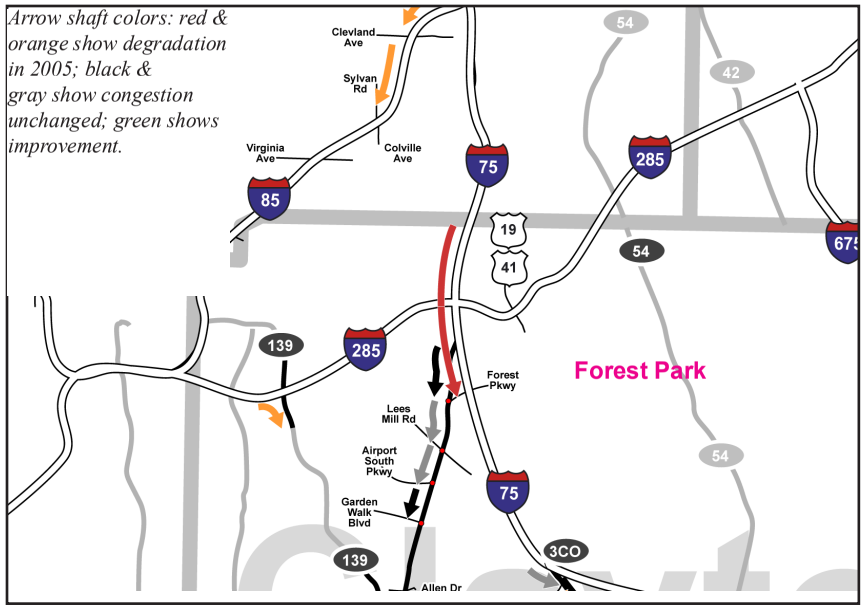
In 1998, traffic from I-75 was congested on northbound I-575 only to the first interchange, Barrett Parkway, with average speeds of approximately 30-40 mph. In 2001, delays extended farther downstream (to the north), to the vicinity of Chastain Road. One year later, in 2002, the first look of I-575 north of SR 92 occurred; congestion was also found for one segment, north to Towne Lake Parkway.

During the 2005 survey flights, these two separate zones of congestion were joined into one long zone, formed by new congestion from Chastain Road to SR 92 (red and orange section in the graphic). Based on traffic densities, expected average travel speeds for the entire 8-mile distance were from 30 to 50 mph, with the greatest delays between Chastain and Bells Ferry Roads.



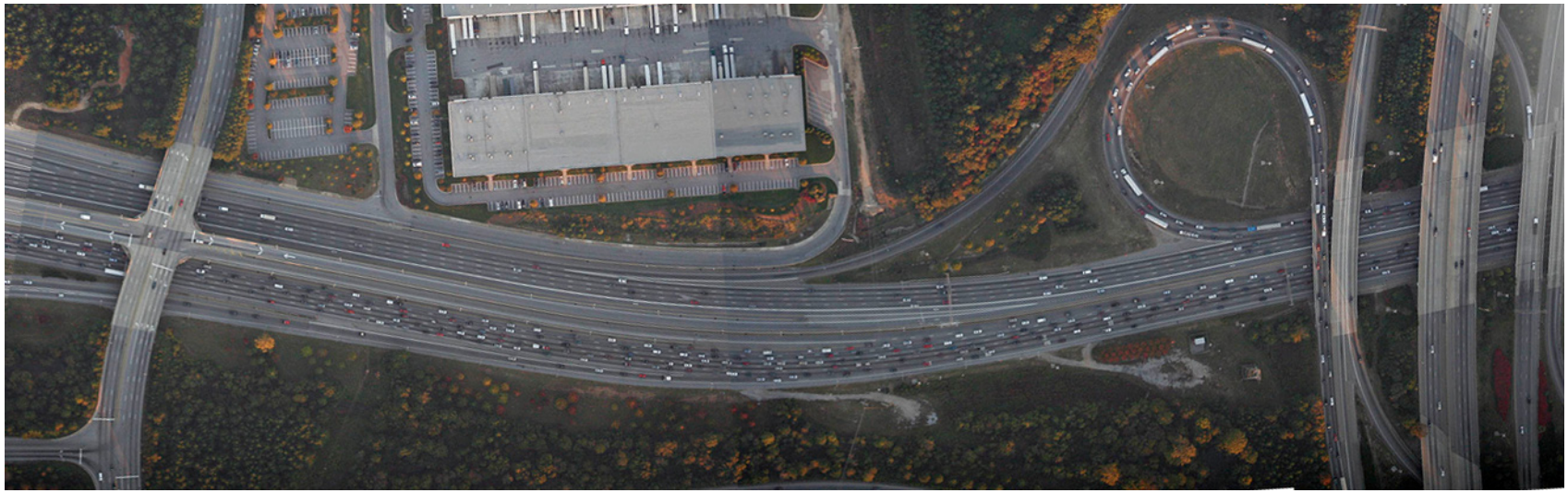
I-575 at SR 92; northbound flow is to the left (2005)

Evening Site 2: FREEWAY DEGRADATION: Southbound I-75 in Clayton County vicinity Forest Park / Hartsfield Airport (EVENING):

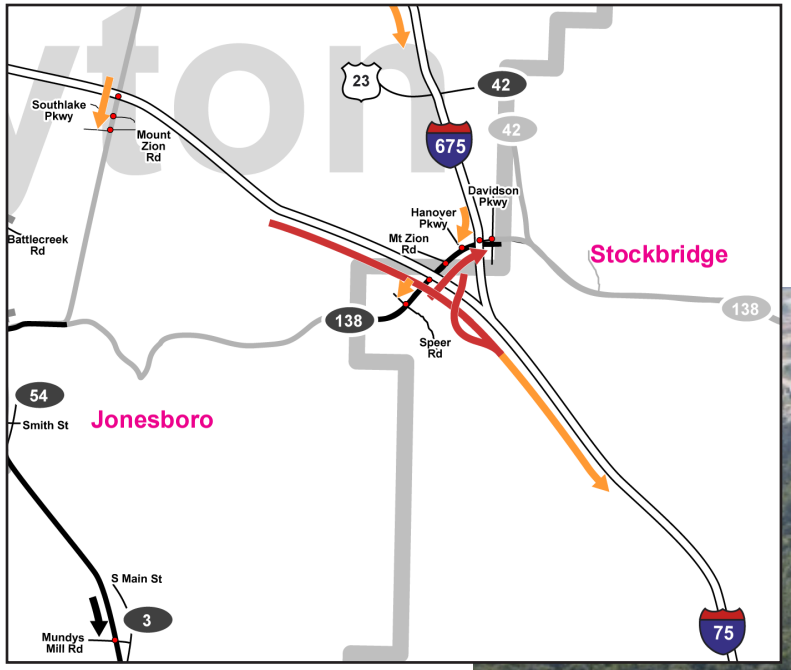


Minor southbound congestion during the peak hour was found on the I-75 mainline at I-285 during both the 1998 and 2001 survey periods. The primary cause appeared to be heavy traffic merging downstream from the two-lane ramp from I-285, exacerbated by that traffic's need to weave across I-75 vehicles exiting to Forest Parkway (the length of the weaving section is only .25 miles). Still, delays in 1998 and 2005 were not significant, as I-75 traffic speeds were reduced only to 40-50 mph for about one mile. Conditions were more congested in 2005, with delays being encountered farther upstream, on the last mile before the I-285 interchange. Average travel speeds in the range of 20-35 mph for a distance of about 1.5 miles were consistently found during the peak hour.

BELOW: Southbound congestion (to the right) approaching the I-285 interchange; at the left edge, the HOV lane is ending; the merging traffic from the right is from Aviation Blvd and S.



Evening Site 3: FREEWAY DEGRADATION: Southbound I-75 from Clayton County into Henry County vicinity Jonesboro and Stockbridge (EVENING):



Arrow shaft colors: red & orange show degradation in 2005; black & gray show congestion unchanged; green shows improvement.

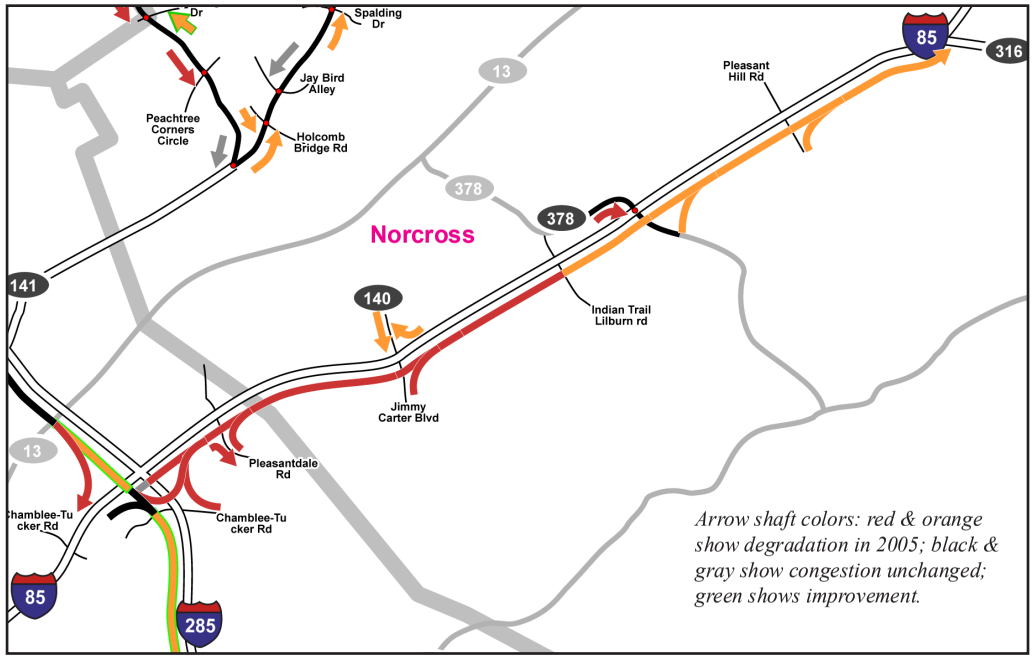
In 1998 and 2001, only minor, intermittent slowing was found at the I-75 / I-675 merge near Stockbridge. By contrast, moderate to severe congestion was found here in 2005, with peak hour average travel speeds as low as 10-20 mph on the last mile approaching the merge. Beyond the merge, average speeds typically picked up gradually approaching the Hudson Bridge Road interchange.

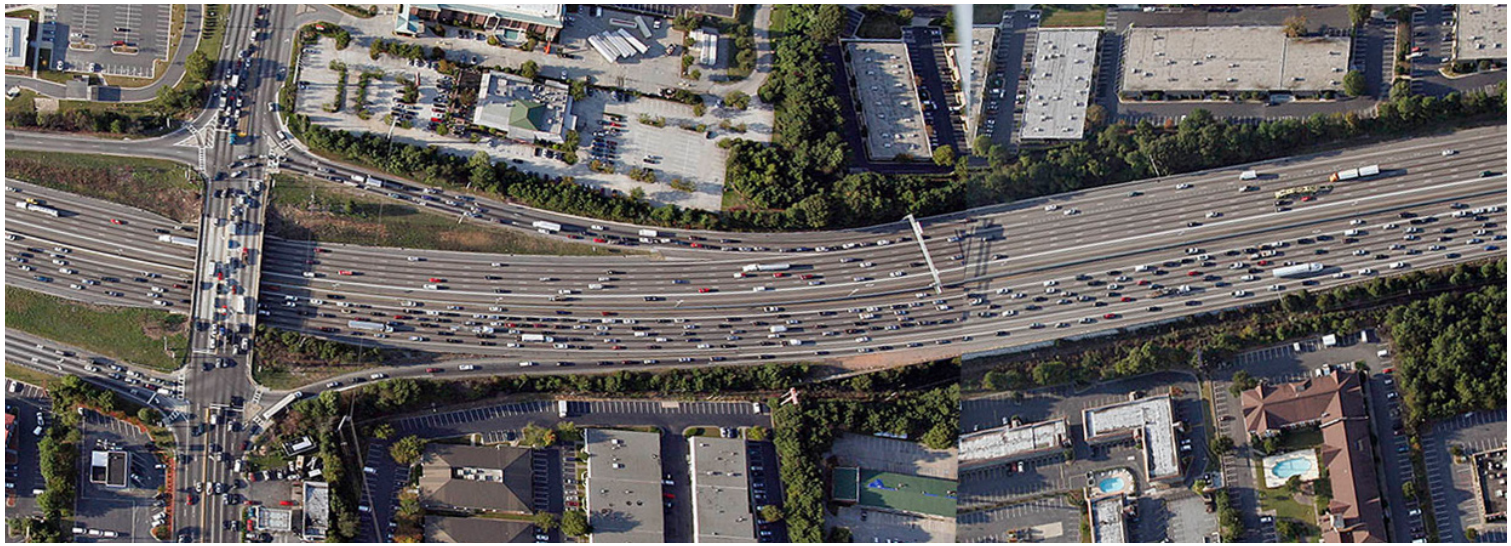
RIGHT: Severe congestion was found in 2005 at the merge of I-75 and I-675. Only intermittent delays were found here in 2001 and 1998.

Evening Site 4: FREEWAY DEGRADATION: Northbound I-85 from DeKalb County into Gwinnett County vicinity Norcross (EVENING):

The extended 8.5 mile I-85 HOV lane between I-285 and Pleasant Hill Road opened shortly before the 2001 survey flights began; accordingly, during that survey period the general-purpose lanes of I-85 generated only minor delays, with average travel speeds down to about 40 mph for only a few segments. Conditions were substantially degraded during the 2005 survey flights. The most severe congestion was found between I-285 and Jimmy Carter Blvd, with average speeds between 20 and 30 mph during the peak hour. Beyond the Jimmy Carter Blvd interchange, flow typically improved, with average speeds in the 30-50 mph range.

In 2005, the HOV lane provided substantial relief for qualified vehicles; HOV users encountered minor delays some evenings near the I-285 interchange, but then moved without significant delay for the length of the HOV facility.

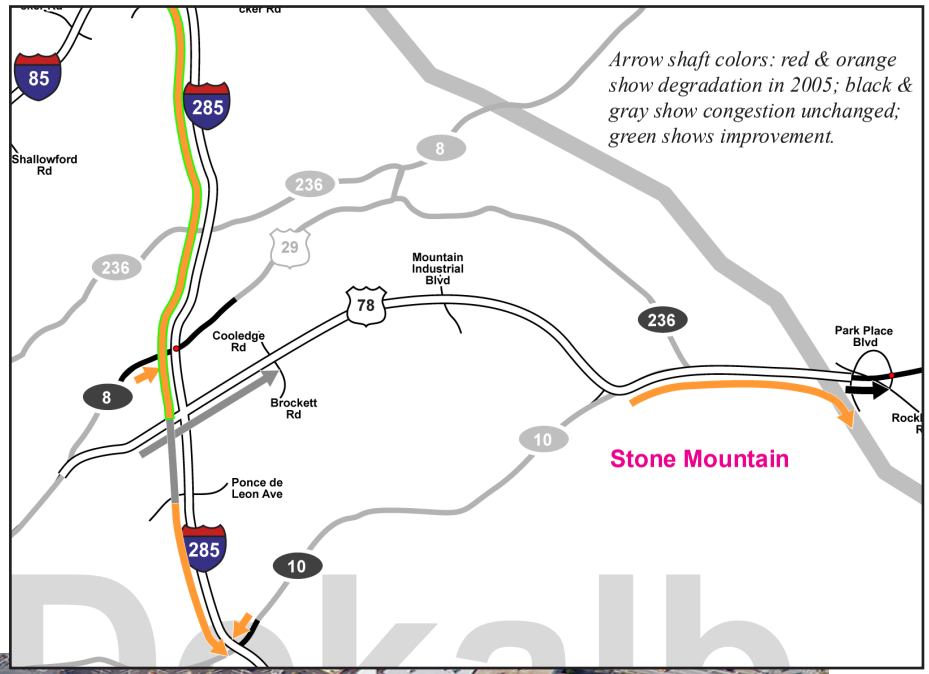




Northbound congestion on I-85 is shown at Jimmy Carter Blvd; traffic flow improved north of the high-volume entrance ramp merge visible above. (2005)

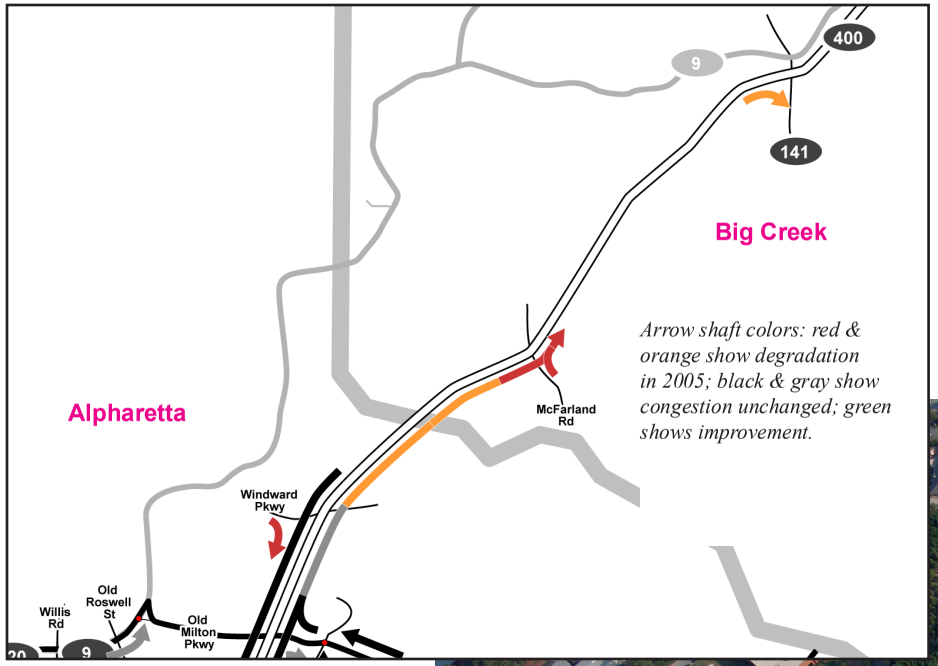
Evening Site 5: FREEWAY DEGRADATION: Eastbound US 78 from DeKalb County into Gwinnett County vicinity Stone Mountain (EVENING):

In 1998 and 2001, eastbound traffic approaching the terminus of the freeway section of US 78 was not delayed until reaching the signal at Park Place Blvd; thus vehicles exiting to Rock Bridge Road at the last freeway ramp did not encounter delays on US 78. However, in 2005, a two-mile queue was consistently found approaching that last ramp; average travel speeds were typically in the 30-40 mph range. The apparent cause of this change was that demand now exceeded the one-lane capacity of the exit lane toward Rock Bridge Road (beyond the one-lane segment, the ramp opens to five lanes approaching the intersection).

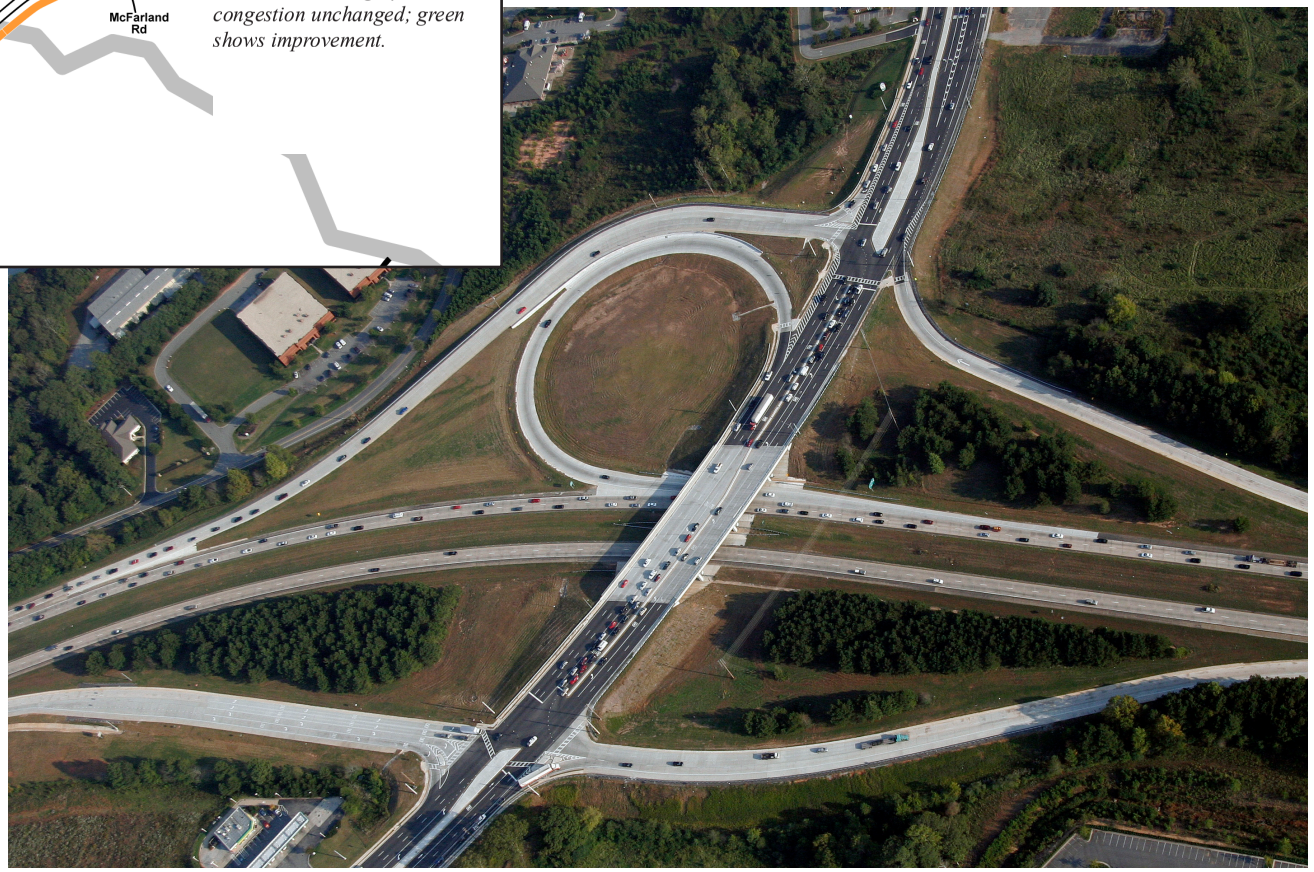


BELOW: Eastbound traffic on US 78 is flowing to the right; the grade-separated interchange on the right is at Rock Bridge Road. The high demand for the single lane exiting toward Rock Bridge Road (evident in this photo) marked the head of this two-mile zone of congestion. (2005)

Evening Site 6: FREEWAY DEGRADATION: Northbound SR 400 from Fulton County into Forsyth County vicinity Alpharetta and Big Creek (EVENING):



BELOW: SR 400 at McFarland Rd; northbound congestion is to the left. Beyond this merge, flow gradually improved. (2005)



In 2001 and 2002, Windward Parkway marked the northern limit of the extended zone of moderate to severe northbound congestion on SR 400. During the survey flights in 2005, congestion extended past the Windward Parkway interchange, and continued to a point north of the McFarland Road interchange. Speeds in this newly congested zone averaged from about 35 to 50 mph; flow improved but remained heavy north of the merge at McFarland Road.

Arterial Mobility improvement and degradation:

The next section of Part Two presents where each of the most significant improvements and degradations were found on the surveyed signalized arterial highways, based on the dates surveyed in 2001/02 and 2005. Please note that where changes were found, some such changes could be temporary as the traveling public shifts its behavior to rebalance the system.

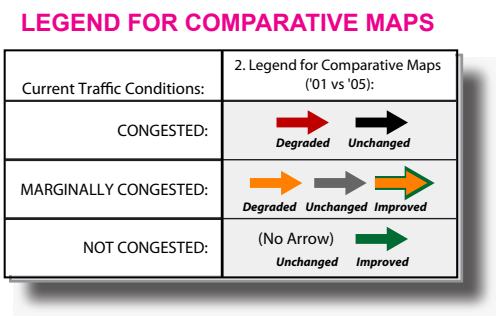
SIGNALIZED ARTERIAL SITES:

Significant / apparent arterial improvements, 2001 vs. 2005:

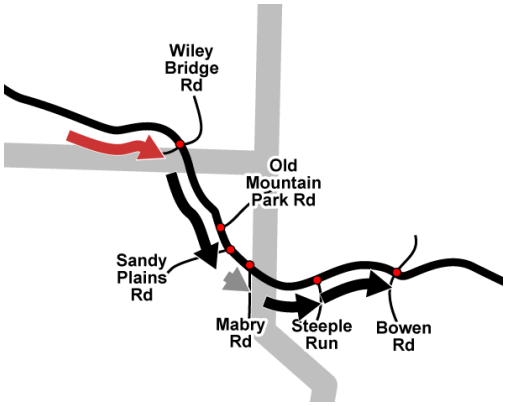
1. Southbound SR 141 at Old Alabama Road in Alpharetta, morning;
2. Westbound SR 140 (Holcomb Bridge Rd) approaching SR 400 in Roswell, morning;
3. Northbound SR 140 approaching Spalding Drive in Norcross, evening;
4. Eastbound SR 120 (Old Milton Parkway) at State Bridge Road in Alpharetta, evening;
5. Westbound SR 120 at Elkins Road in Roswell, evening;
6. Southbound SR 85 (Glynn Rd) at Banks Rd in Fayetteville, evening.

Significant / apparent arterial degradations, 2001 vs. 2005:

1. Eastbound SR 92 corridor from Acworth to Roswell, morning;
2. Eastbound SR 3, SR 120, and SR 5C approaching Marietta and Kennesaw, morning;
3. Southbound SR 6 approaching the Chattahoochee River in Douglas County (Lithia Springs), morning;
4. Eastbound SR 120 corridor between Marietta and Roswell, morning;
5. Crossroads along SR 141 near the Chattahoochee River in Alpharetta, evening;
6. Southeast-bound SR 140 corridor in Norcross, evening;
7. Both directions, SR 92 corridor in Acworth, evening;
8. South- and westbound SR 5C, SR 120 and SR 176 corridor from Marietta, evening;
9. Both directions, SR 6 at I-285 (west side), evening;
10. Eastbound US 78 approaching Fountain and Knollwood Drives in Snellville, evening;
11. Southbound arterials vicinity Jonesboro, Lovejoy and Fayetteville, evening.



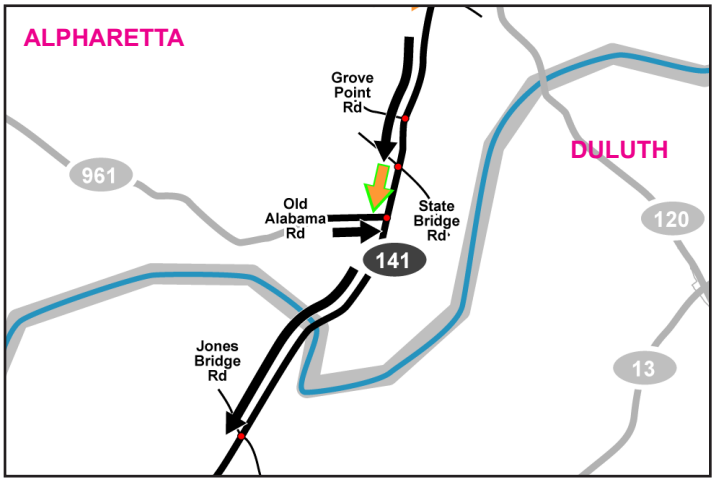
Right: On comparative maps, black and gray show congestion that has not changed significantly; colors are reserved for degraded or improved conditions.



1. ARTERIAL IMPROVEMENT: Southbound SR 141 at Old Alabama Rd in Alpharetta, MORNING:

In 2001, southbound congestion was typically found approaching the signal at Old Alabama Rd; in some cases, the queue extended back through the upstream signal at State Bridge Rd. During the 2005 survey, southbound travelers typically cleared the signal at Old Alabama Rd with minimal delay. A widening project at the Chattahoochee apparently accounted for this improvement.

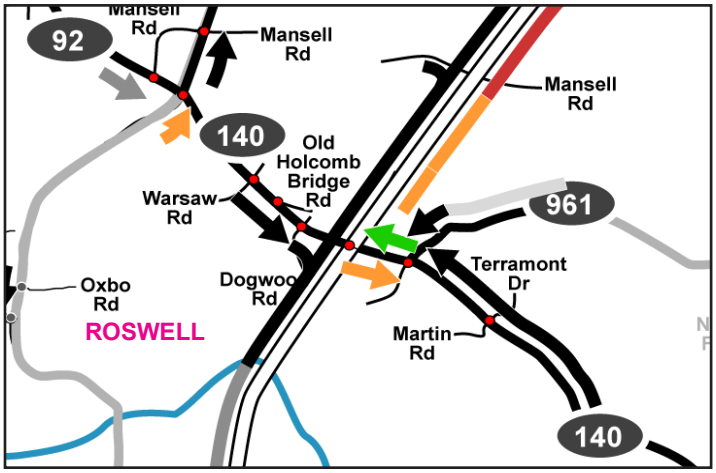
(Ref; Project PI-133090; MPO TIP GW281 "ATMS")



2. ARTERIAL IMPROVEMENT: Westbound SR 140 (Holcomb Bridge Road) approaching SR 400 in Roswell, MORNING:

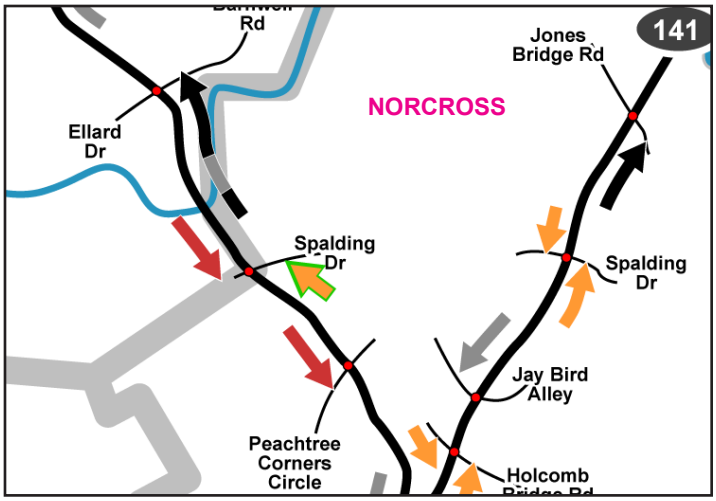
Signal queues on Holcomb Bridge Road at SR 400 found in 2001 were not found in 2005. This benefit can be attributed (at least in part) to improvements made at the SR 400 interchange, particularly an extended right turn lane from SR 140 to northbound SR 400.

(Ref; Project PI-0004309 "Intersection improvements")



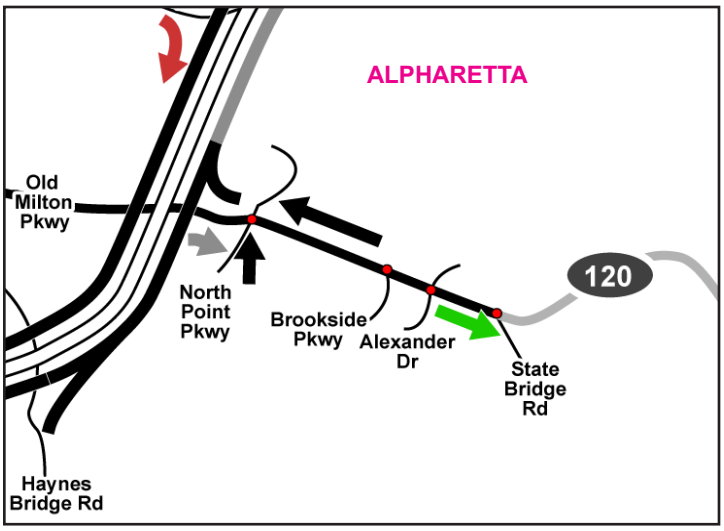
3. ARTERIAL IMPROVEMENT: Northbound SR 140 approaching Spalding Drive in Norcross, EVENING:

In 2001, northbound congestion was found on Holcomb Bridge Road (SR 140) during most observations approaching the signal at Spalding Dr; in some cases, queue populations approached 100 vehicles per lane (two lanes). During the 2005 survey, congestion found here was intermittent, with queue populations often less than 25 vehicles per lane. (The reason for this apparent improvement has not been identified; it may have been due to ordinary day-to-day variations.)



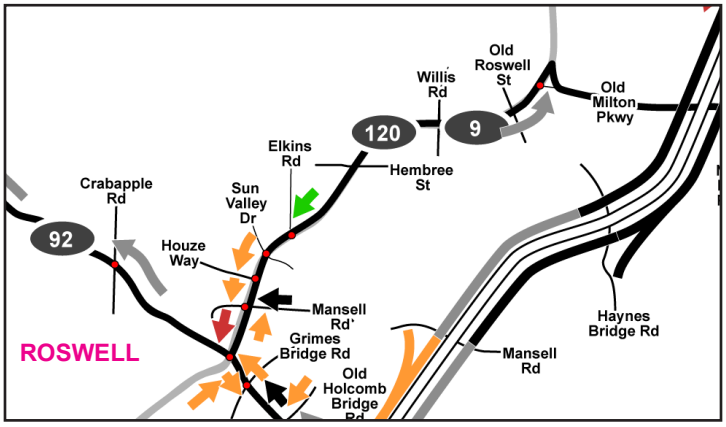
4. ARTERIAL IMPROVEMENT: Eastbound SR 120 (Old Milton Parkway) at State Bridge Rd in Alpharetta, EVENING:

In 2001, eastbound congestion was found during most observations on SR 120 approaching the signal at State Bridge Rd; during the peak period, the queue sometimes extended through the upstream signal at Brookside Pkwy. Congestion was not found at State Bridge Rd during the 2005 survey. Widening of State Bridge Road beyond the signal (under construction in 2005) may have influenced travel behavior in this area; however, a specific capacity increase was not evident; day-to-day variation could also have played a role.



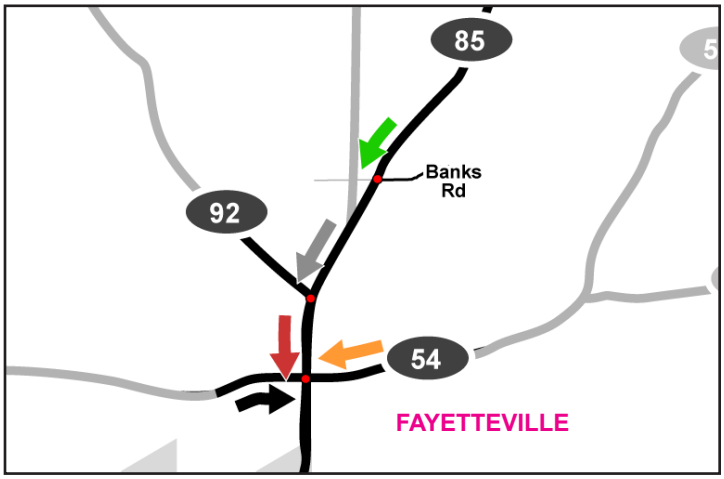
5. ARTERIAL IMPROVEMENT: Westbound SR 120 at Elkins Road in Roswell, EVENING:

In 2001, westbound congestion was found on SR 120 (SR 9) during most observations approaching the signal at Elkins Rd; congestion was not found at Elkins Rd during the survey in 2005. (The reason for this apparent improvement has not been identified; this may have been due to day-to-day variation.)



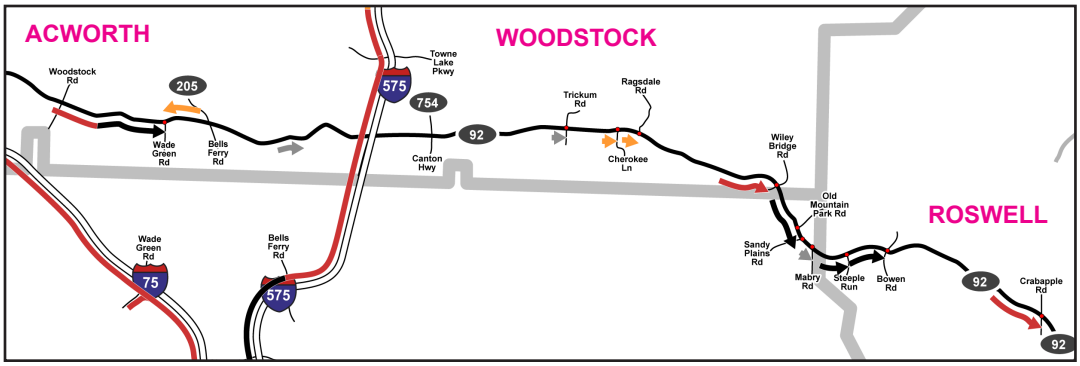
6. ARTERIAL IMPROVEMENT: Southbound SR 85 (Glynn Street) at Banks Rd in Fayetteville, EVENING:

In 2002, southbound congestion was found during most observations on SR 85 approaching the signal at Banks Rd; queue populations typically ranged from 20 to 60 vehicles per lane (two lanes). Congestion was not found at Banks Rd during the 2005 survey. (The reason for this apparent improvement has not been identified; this may have been due to day-to-day variation.)

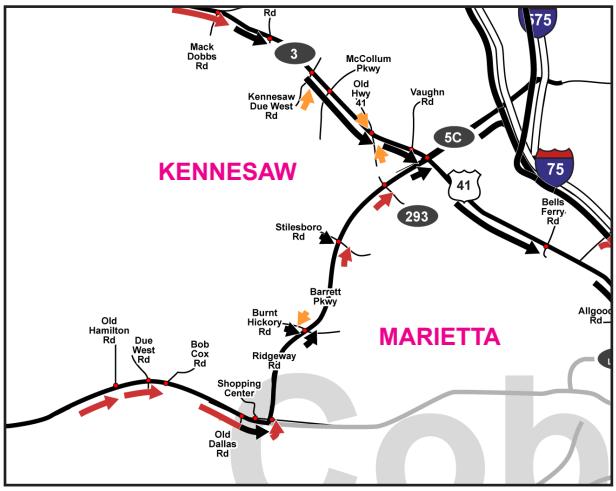


1. ARTERIAL DEGRADATION: Eastbound SR 92 Corridor from Acworth to Roswell, MORNING:

In 2001, eastbound queues were found during the morning peak period along SR 92 approaching the signal at Wade Green Rd, and at a series of signals approaching Roswell. In 2005 the single-file queue at Wade Green Road sometimes extended upstream to Woodstock Rd; new queues were also found in 2005 approaching the signals at Wiley Bridge Rd and Crabapple Rd.

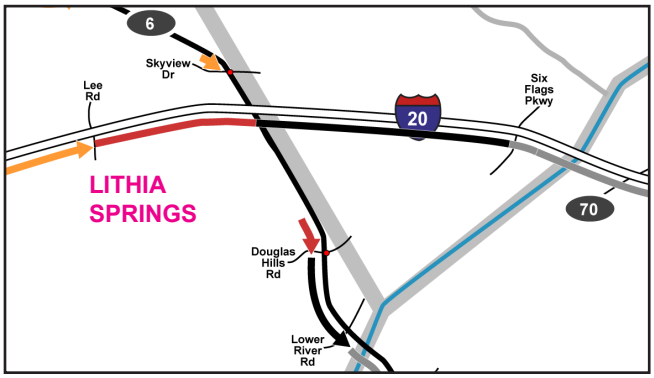


2. ARTERIAL DEGRADATION: Eastbound SR 3, SR 120 and SR 5C approaching Marietta and Kennesaw, MORNING:



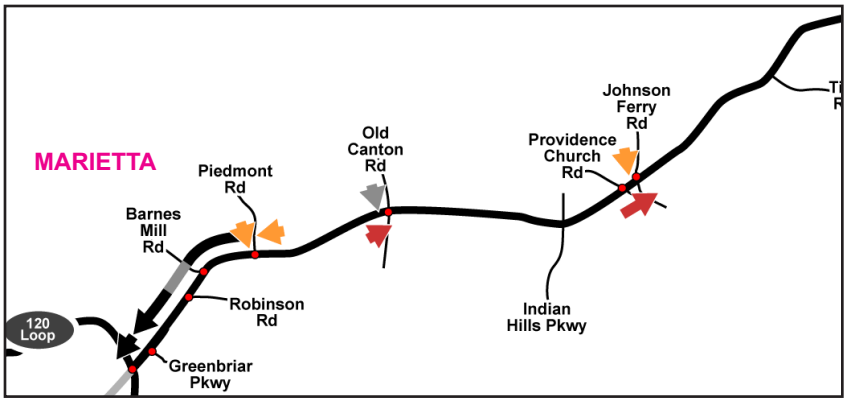
The signalized arterial corridors approaching and through Kennesaw generated substantial congestion during the 1998 and 2001/02 survey periods. Further evidence of degradation was found in 2005, with new persistent queues found at several signals where only intermittent queues had been previously found: Mack Dobbs / Rutledge on SR 3; Old Hamilton, Due West and Old Dallas on SR 120; and Stilesboro Rd and Old US 41 on SR 5C.

3. ARTERIAL DEGRADATION: Southbound SR 6 approaching the Chattahoochee River in Douglas County (Lithia Springs), MORNING:

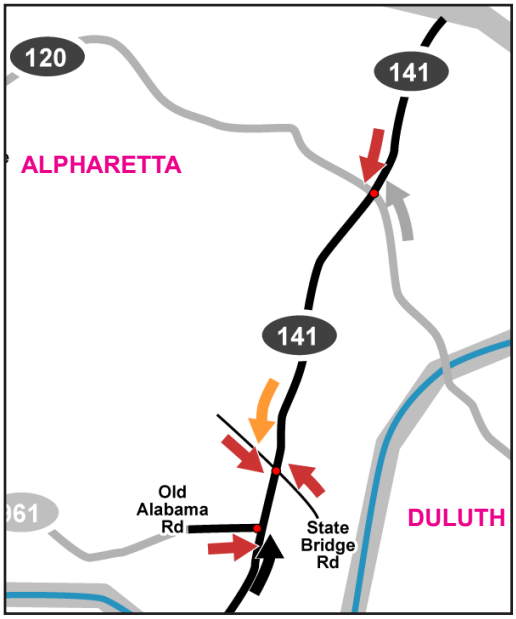


Previous surveys documented congestion on southbound SR 6 approaching the signal at Lower River Rd, and then farther downstream approaching Fulton Industrial Blvd. In 2005 this congestion began earlier, with persistent queues found approaching the signal at Douglas Hills Rd.

4. ARTERIAL DEGRADATION: Eastbound SR 120 Corridor between Marietta and Roswell, MORNING:

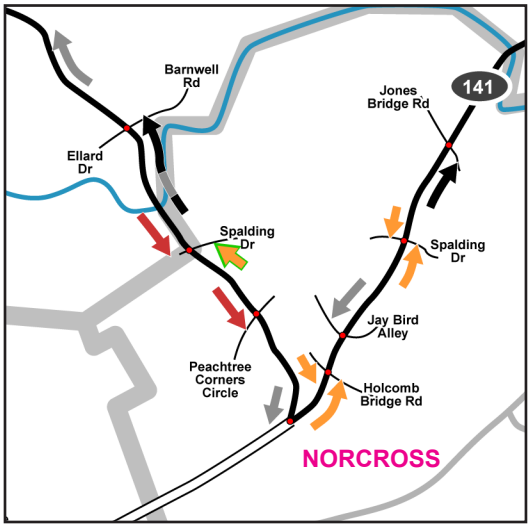


While intermittent congestion was found in 2001 approaching the signal at Old Canton Rd, such congestion in 2005 was found during most observations. Farther downstream, new congestion was found approaching the signal at Johnson Ferry Rd; in some cases traffic was backed through the signal at Providence Church Rd.



5. ARTERIAL DEGRADATION: Crossroads along SR 141 near the Chattahoochee River in Alpharetta, EVENING:

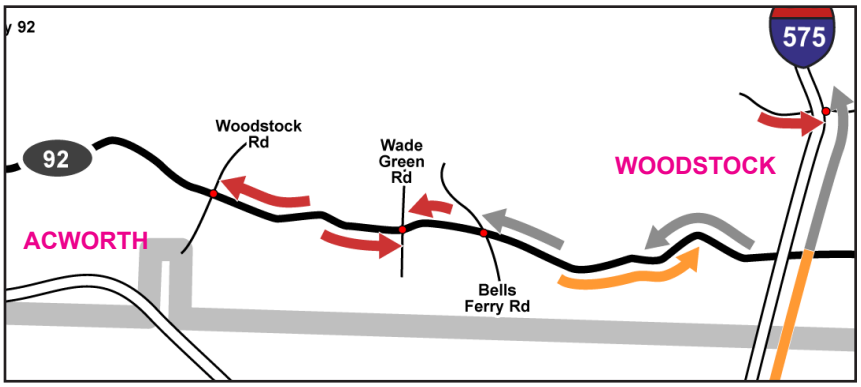
Southbound traffic on SR 141 at SR 120 (Abbotts Bridge Rd) encountered significant delays in 2005, caused in part by spillback from the left-turn lanes at SR 120, and also by a closer blockage comprised of vehicles waiting to turn left across northbound traffic at Bell Rd. To the south, degraded conditions were also found on crossroads at State Bridge and Old Alabama Rds.



6. ARTERIAL DEGRADATION: Southeastbound SR 140 corridor in Norcross, EVENING:

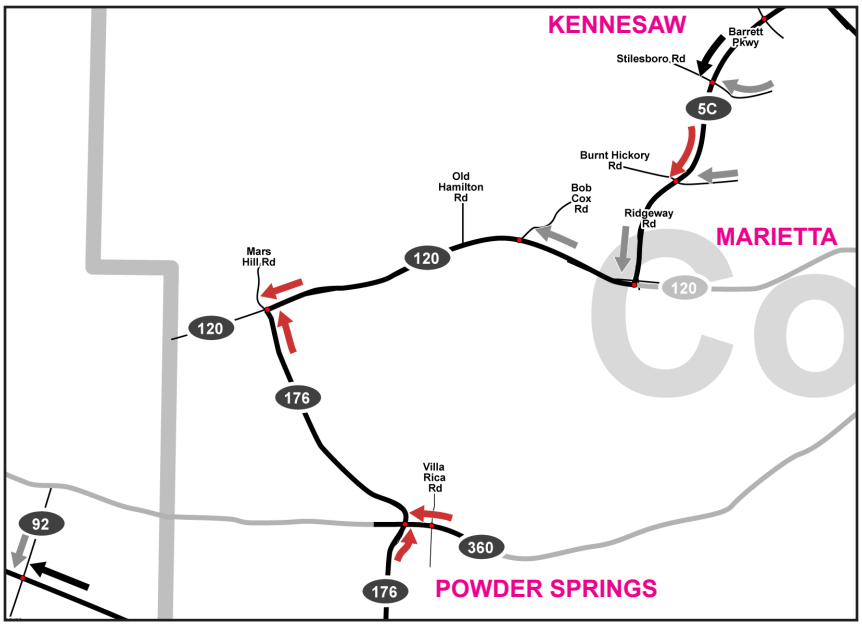
Southbound congestion was not found during the evening survey period on SR 140 across the Chattahoochee River and through Norcross in 2001. However, the signals at Spalding Dr and Peachtree Corners Circle generated significant delays during most peak-period observations in 2005.

7. ARTERIAL DEGRADATION: Both Directions, SR 92 Corridor in Acworth, EVENING:



In 2001, westbound congestion was found on SR 92, approaching the adjacent signals at Bells Ferry and Robin Roads. While similar congestion was found there in 2005, additional bottlenecks were now found downstream approaching the signals at Wade Green and Woodstock Roads. Also in 2005, eastbound deays at Wade Green Rd were significant.

8. ARTERIAL DEGRADATION: South- and Westbound SR 5C, SR 120 and SR 176 Corridor from, EVENING:

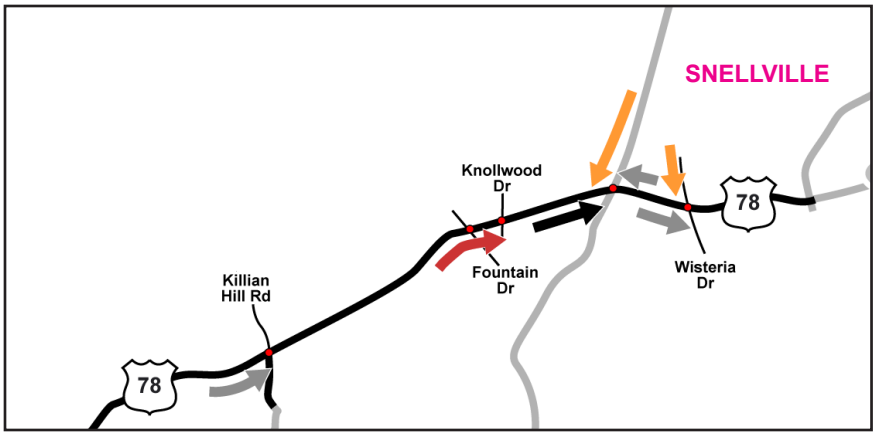


In 2001 west of Marietta, minor, intermittent congestion was found approaching the signals on southbound SR 5C at Burnt Hickory Rd and farther downstream on westbound SR 120 at Mars Hill Rd, In 2005, delays were significantly worse at those two intersections. To the south in Powder Springs, new delays were also found at the intersection of SR 176 and SR 360.

9. ARTERIAL DEGRADATION: Both directions, SR 6 at I-285 (west side), EVENING:

During the 2005 survey flights, congestion was found in both directions on Camp Creek Pky (SR 6) at the I-285 interchange. The eastbound queue was primarily waiting for a left turn to enter northbound I-285.

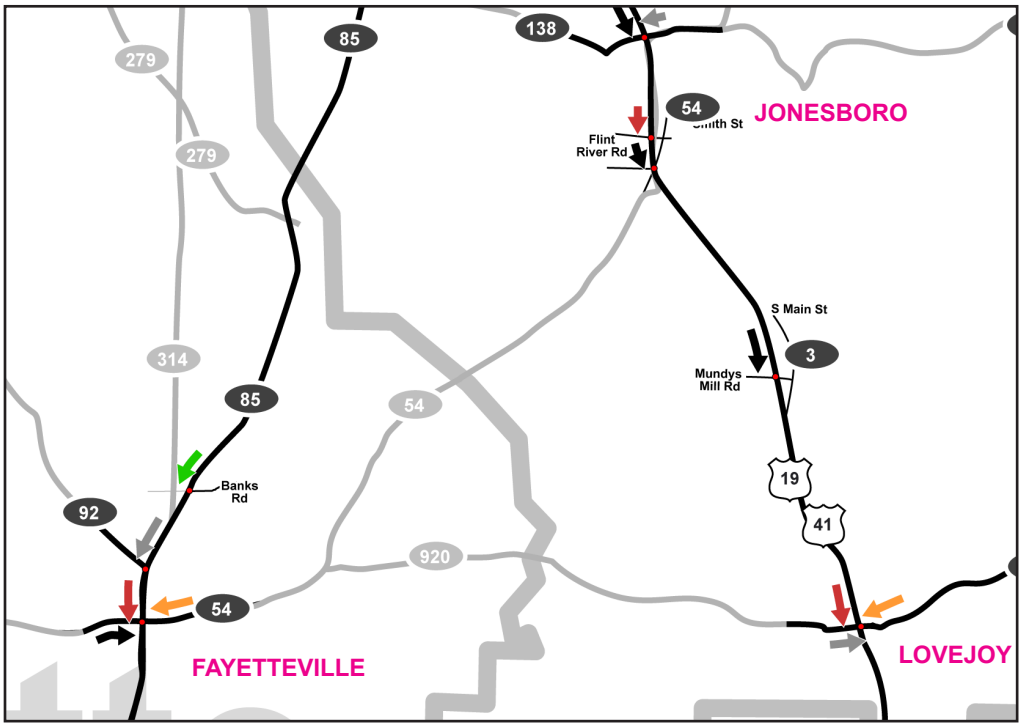
10. ARTERIAL DEGRADATION: Eastbound US 78 approaching Fountain and Knollwood Drives (Snellville), EVENING:



In 2001, intermittent eastbound congestion was found on US 78 approaching the signal at SR 124 in Snelville. In 2005, the queue was significantly longer, with vehicles typically backed through the next two upstream signals (Knollwood and Fountain Drives).

11. ARTERIAL DEGRADATION: Southbound artreials vicinity Jonesboro, Lovejoy and Fayetteville, EVENING:

While trips to the south along the primary signalized arterial corridors of US 19 / 41 and SR 85 did not generate substantial delays in most places, a few worsened bottlenecks were found in 2005: on US 19 / 41 at Flint River Rd and Smith St, and on SR 85 approaching the signal at SR 54 in Fayetteville. Also, new congestion was found on US 19 / 41 approaching the signal at McDonough Rd.



Morning & Evening Comparative Maps
Extended Primary Network, 2005 vs. 2001

The last section of Part Two contains modified bottleneck maps – called "comparative maps" – that show specifically where in the region significant changes have been found on the network, between the set of surveys in 2001 / 2002 and the surveys in 2005. (These maps were the source of the map graphics used in the preceding bottleneck displays.) The comparative maps at first glance will almost seem identical to the bottleneck maps previously discussed in Part One. However, they differ in two important ways: the findings of the 2004 survey flights have been removed, because, having only been surveyed once, there is no basis for evaluating changes on the 2004 arterial network. The second difference is that many – but not all – red and orange arrowhead colors have been switched to black and gray. Those switched to black and gray depict where congestion was not significantly different in 2005 than in '01 / '02. Colors instead have been reserved to highlight where the largest differences were found: red depicts significantly degraded conditions (usually in severity but sometimes in duration or frequency). Improvements have been noted in a few cases; green arrowheads are used to show where significant congestion previously found was no longer found. (The reasons for such change have been noted where evident; still, even in the absence of explanation, apparently-significant improvements have been depicted with green arrowheads.) In the event that severe congestion has been partially mitigated to a less-severe level, orange arrowhead and shafts have been outlined with green borders.

The legend for these maps is shown below; note that red, orange and green colors are used only to highlight significant mobility changes, while unchanged conditions are shown in black and gray.

To view highlight aerial photography for each bottleneck arrowhead shown in the comparative maps, please view the interactive version at the Georgia DOT website: *http://www.dot.ga.gov/statistics/trafficsurvey/*

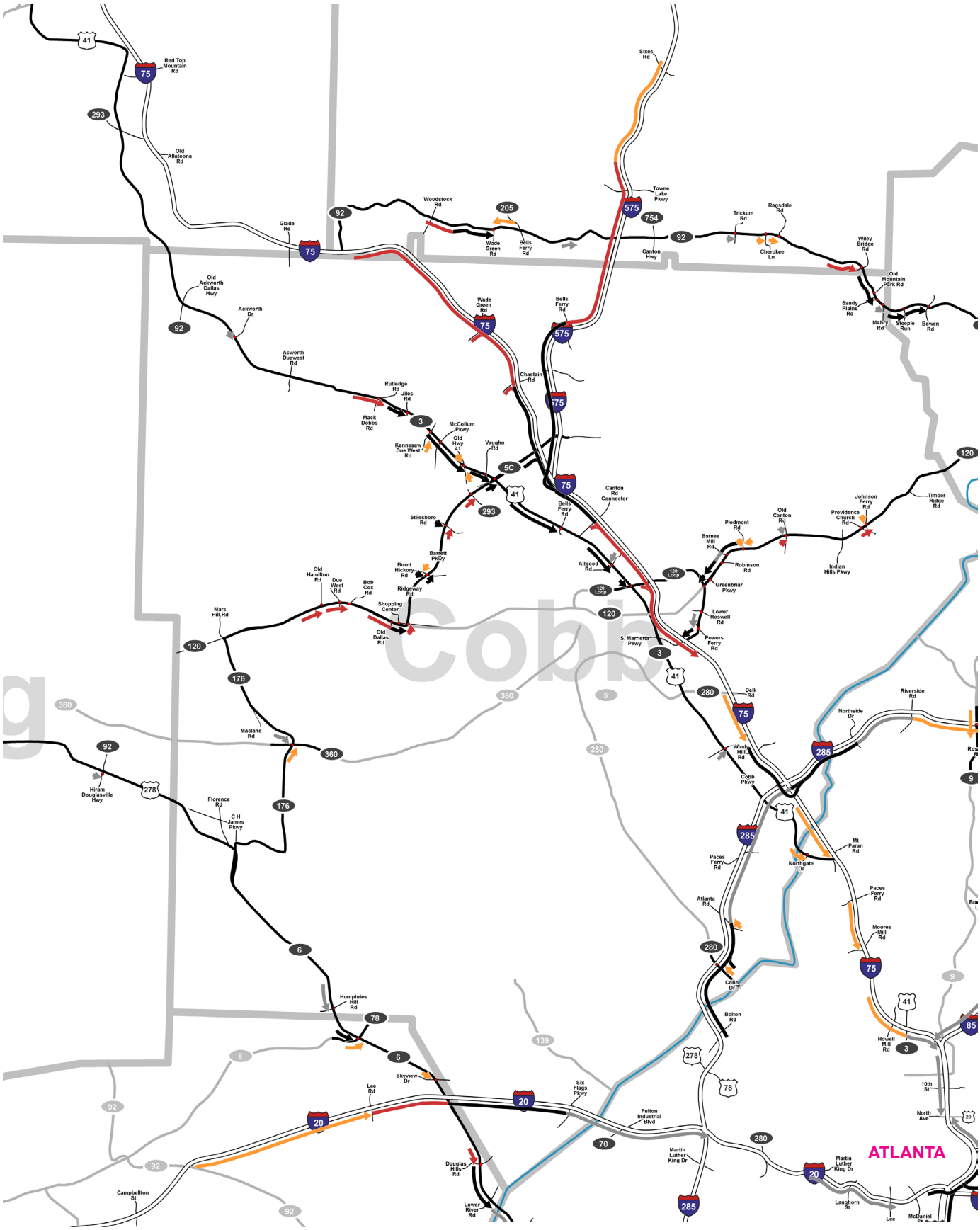
Note about variability: the nature of congestion is that, because it is the product of the interplay of all of the factors that affect when and how people travel, it is not always found in the same exact places every day. While distinct patterns of congestion are evident, even the most "reliably-congested" section of highway can sometimes be congestion-free; conversely, congestion sometimes is found in unlikely places for no discernible reason. All of the data in this survey program have been screened for anomalies, and removed where proper to do so. In this comparative analysis, differences thought to be caused by daily variations have been excluded.

LEGEND FOR COMPARATIVE MAPS ON THE FOLLOWING PAGES:

Current Traffic Conditions:	2. Legend for Comparative Maps ('01 vs '05):
CONGESTED:	Degraded Unchanged
MARGINALLY CONGESTED:	Degraded Unchanged Improved
NOT CONGESTED:	(No Arrow) Unchanged; Improved

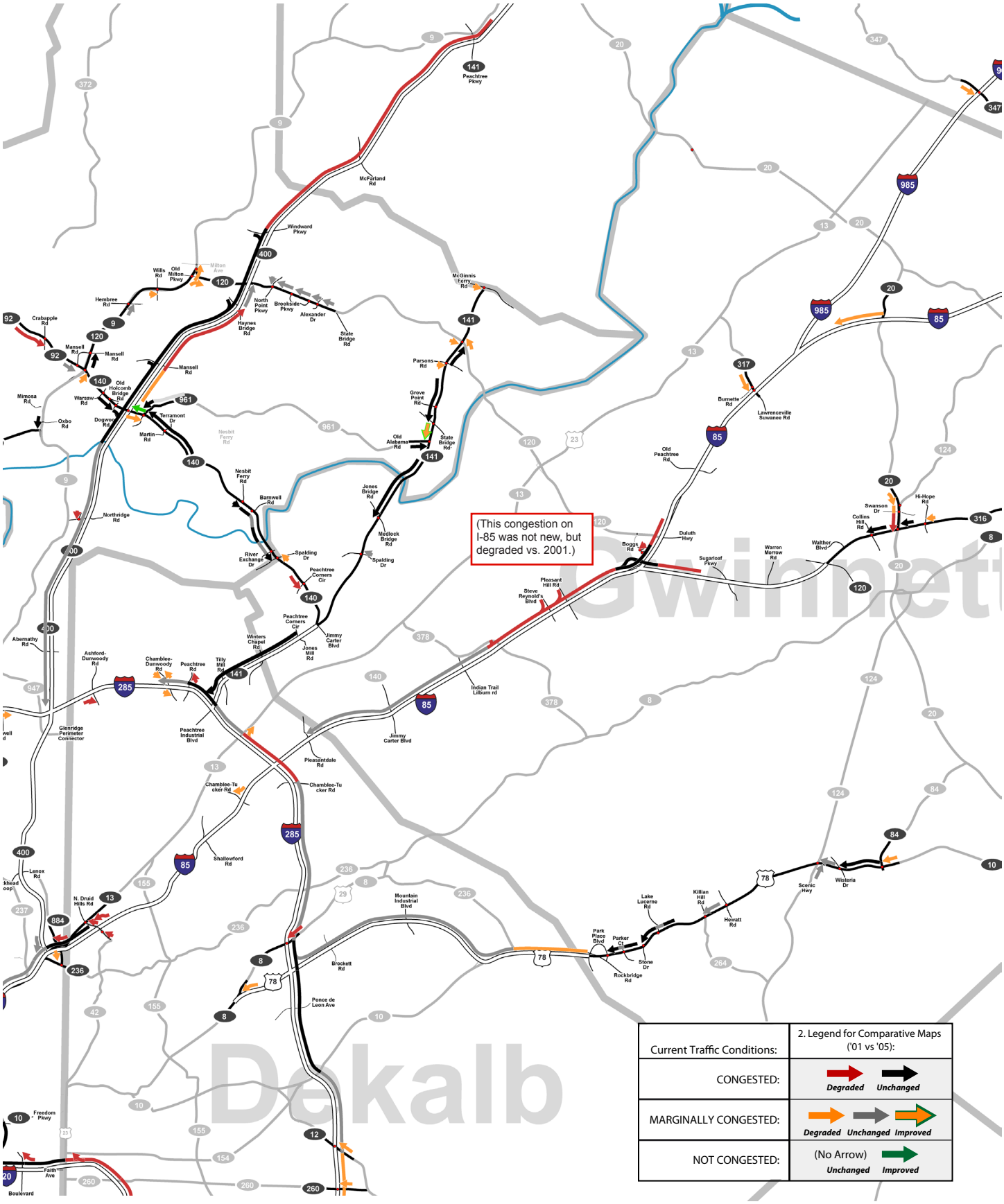
In the comparative maps, colored arrowheads have been used only to show where significant changes were found on the surveyed network; otherwise, congestion was depicted with black or gray arrowheads.

NORTHWEST COMPARATIVE MAP (morning)



(OVERLAPS SOUTHWEST MAP, PAGE 60)

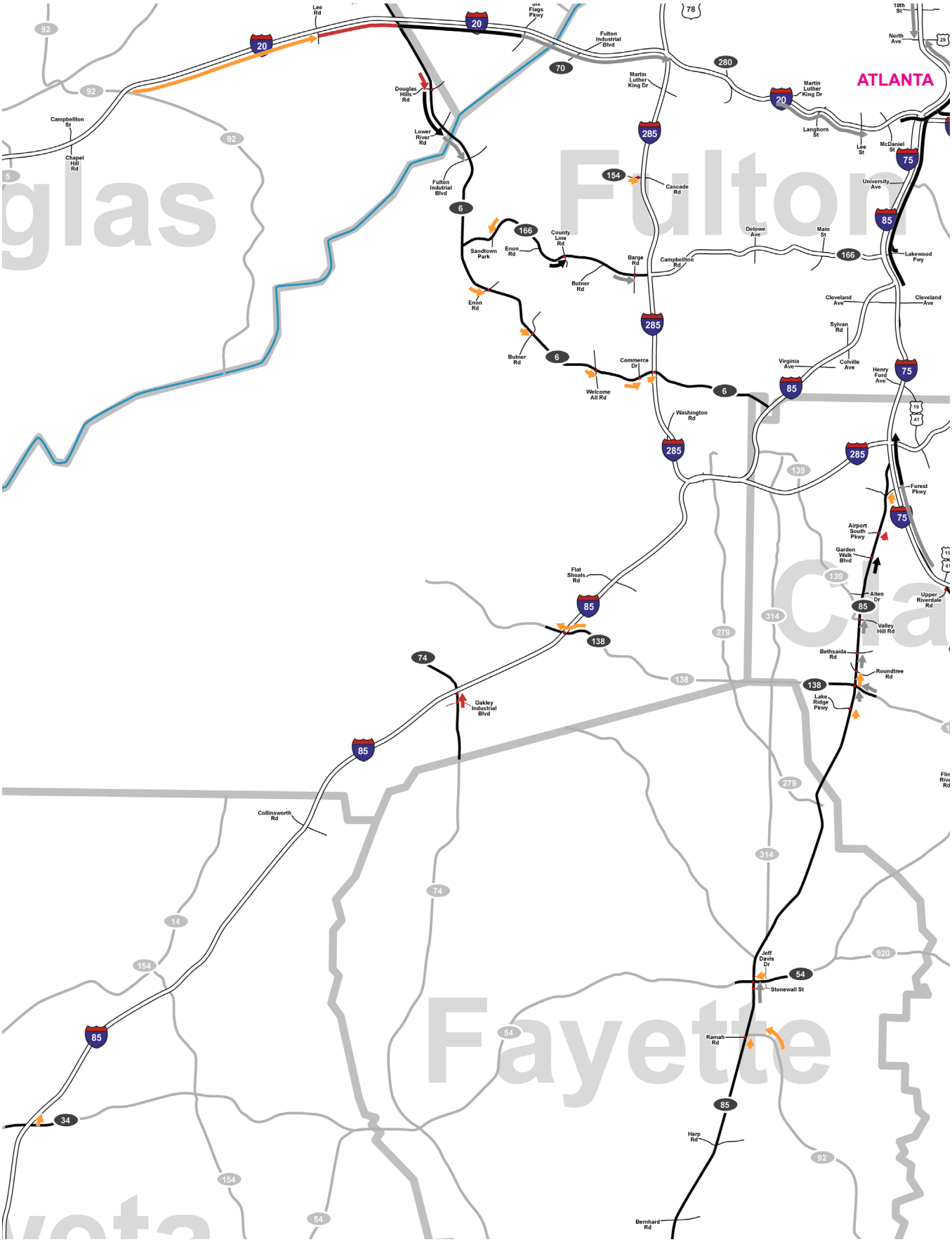
NORTHEAST COMPARATIVE MAP (morning)



(OVERLAPS SOUTHEAST MAP, PAGE 61)

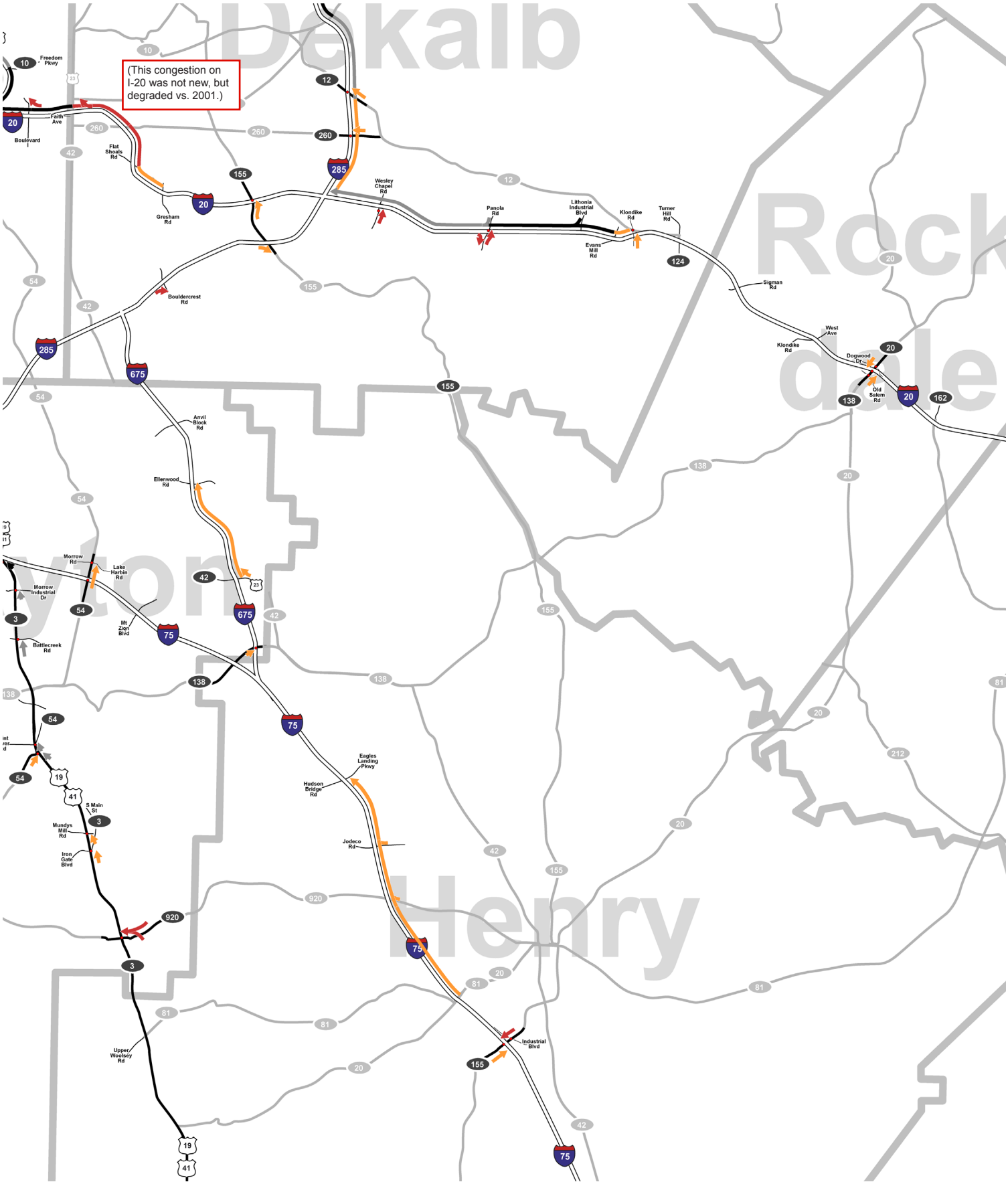
(OVERLAPS NORTHWEST MAP, PAGE 58)

SOUTHWEST COMPARATIVE MAP (morning)



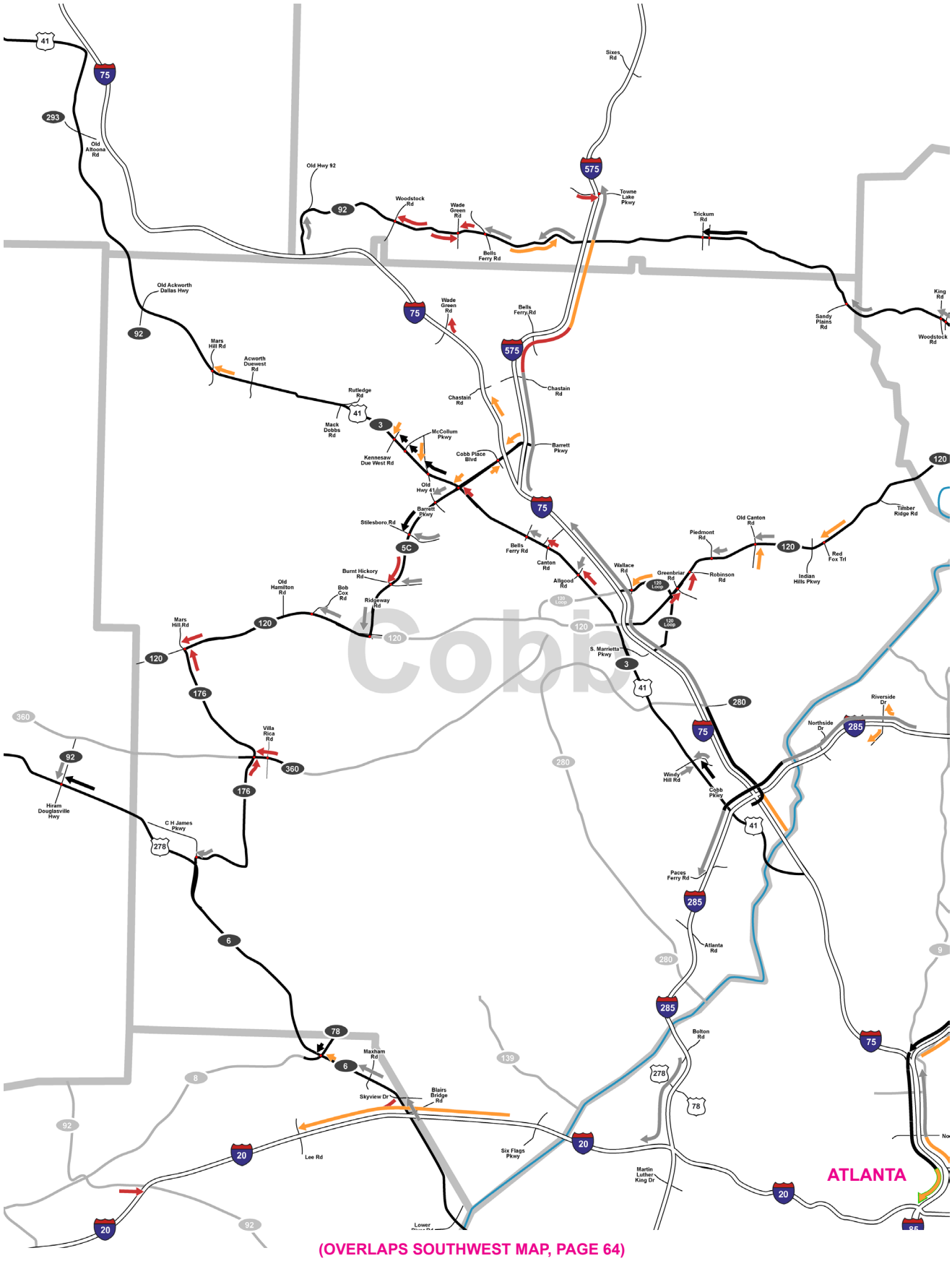
(OVERLAPS NORTHEAST MAP, PAGE 59)

SOUTHEAST COMPARATIVE MAP (morning)



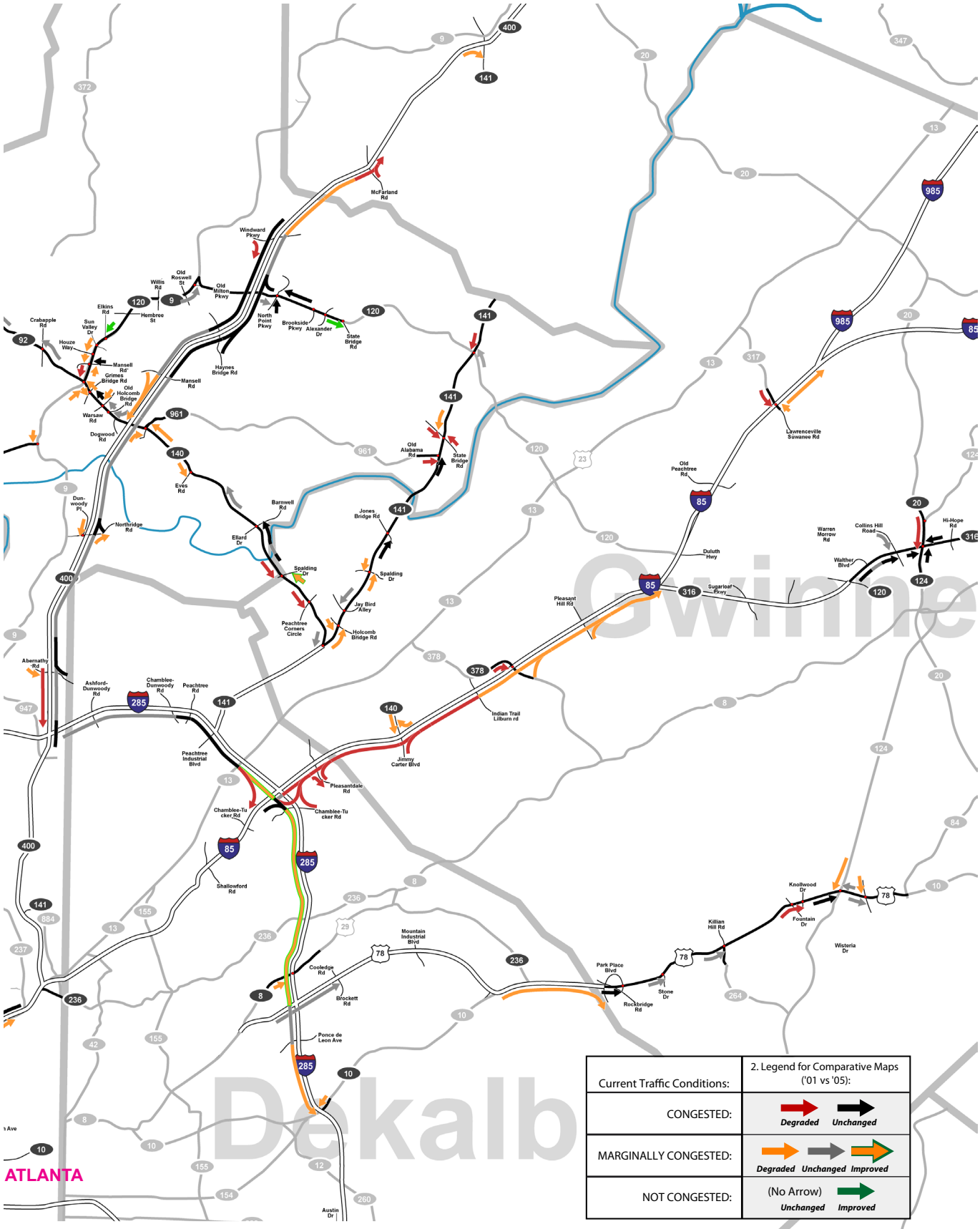
Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

NORTHWEST COMPARATIVE MAP (evening)



(OVERLAPS SOUTHWEST MAP, PAGE 64)

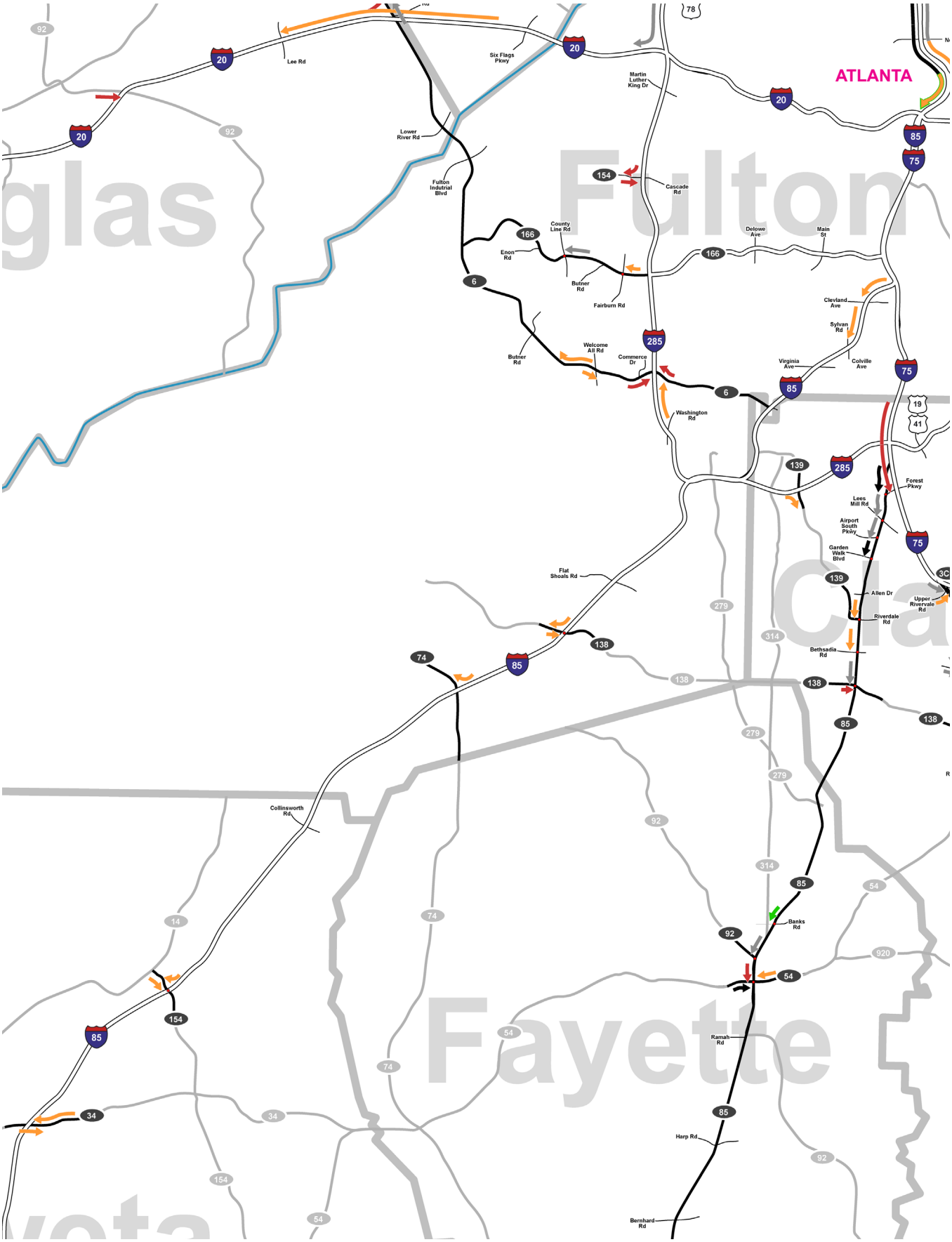
NORTHEAST COMPARATIVE MAP (evening)



(OVERLAPS SOUTHEAST MAP, PAGE 65)

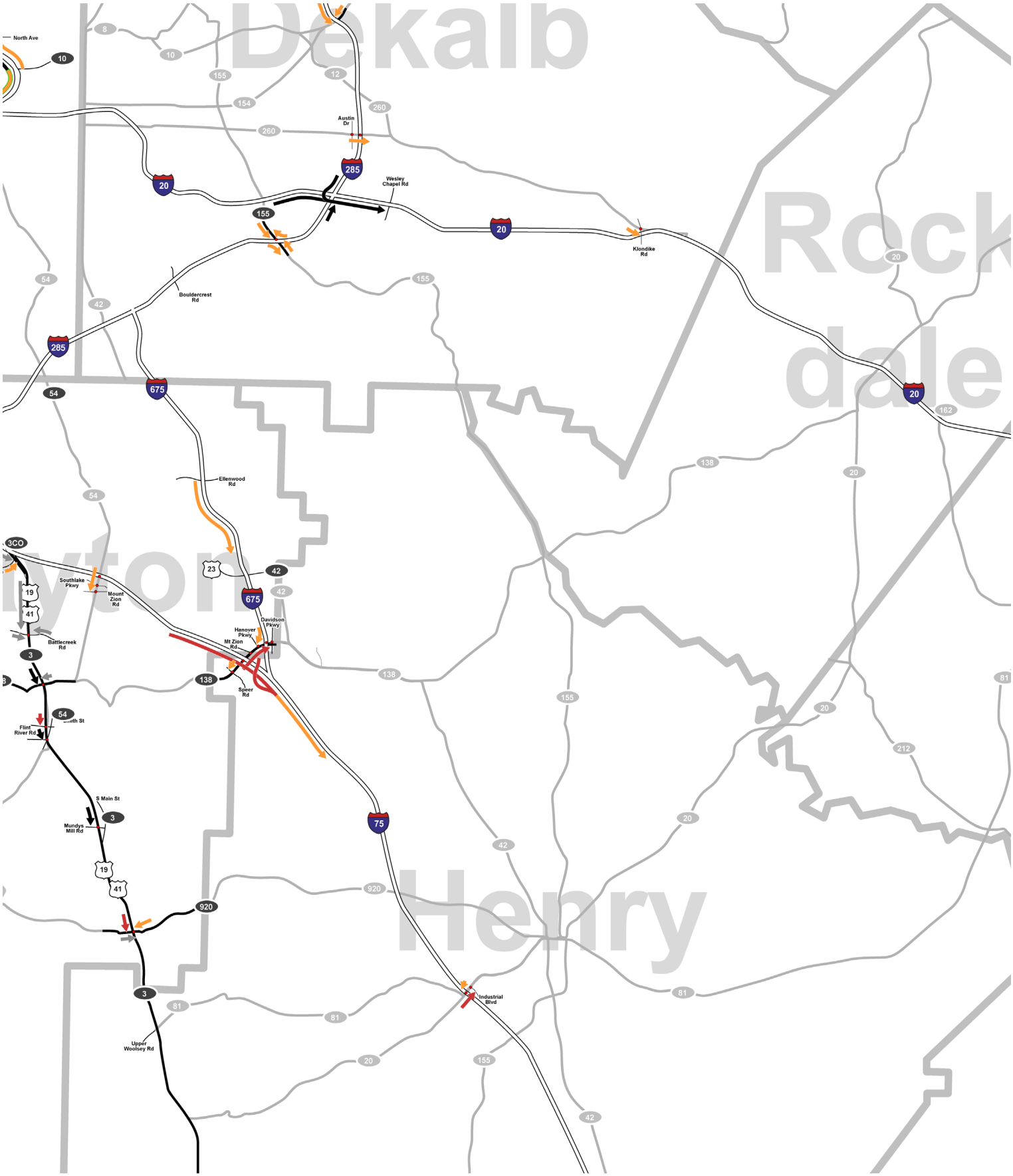
(OVERLAPS NORTHWEST MAP, PAGE 62)

SOUTHWEST COMPARATIVE MAP (evening)



(OVERLAPS NORTHEAST MAP, PAGE 63)

SOUTHEAST COMPARATIVE MAP (evening)



Mobility Assessment and Bottleneck Changes, 2005 vs. 2001

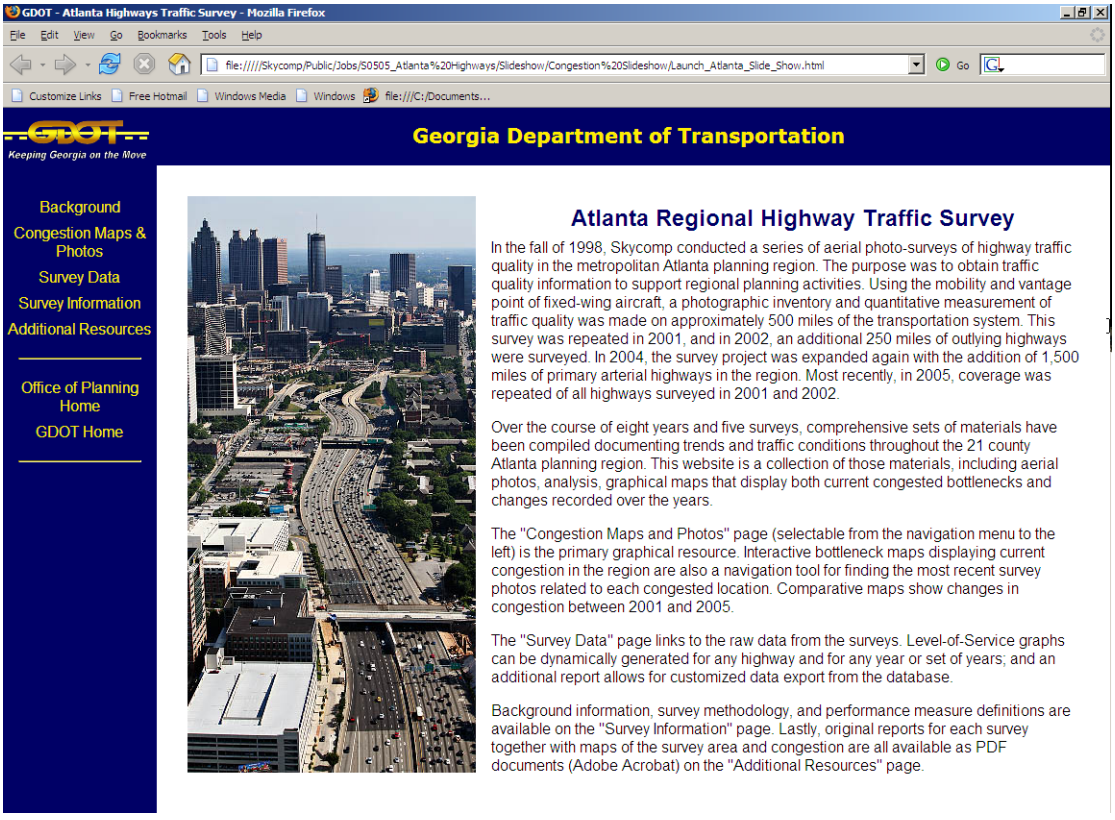
APPENDIX A

Web-based data and visualization tools for assessing changes in highway system performance

The Office of Planning has assembled a set of tools designed to allow participants in the transportation planning process access data, photos and graphics that are relevant to their interests. These are available through the Georgia Department of Transportation website; the URL to the website is:

http://www.dot.ga.gov/statistics/trafficsurvey/

Part One of this report describes the tools available at this website for understanding the nature of congestion across the state highway network, and how it has been changing in recent years.



Tool #1: Web-based Bottleneck Maps

On the website, all bottlenecks identified during the survey flights are posted to large morning and evening bottleneck maps. Each map covers the entire 22-county survey region; users are provided with zoom and pan tools to navigate Red arrows are used to depict severe congestion, while orange arrows depict marginal or intermittent congestion.

Most arrows in the bottleneck maps are linked to associated highlight aerial photographs, allowing a user to take a "virtual" aerial tour of peak-period congestion any where on the surveyed network:

Figure 1: Legend for the bottleneck maps;

Figure 1

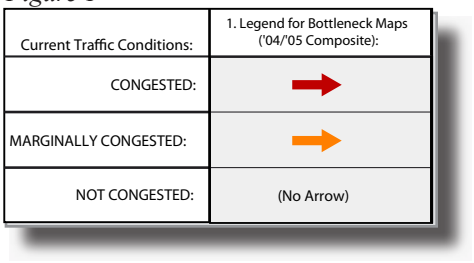


Figure 2: Depiction of congestion from a bottleneck map.

Figure 2

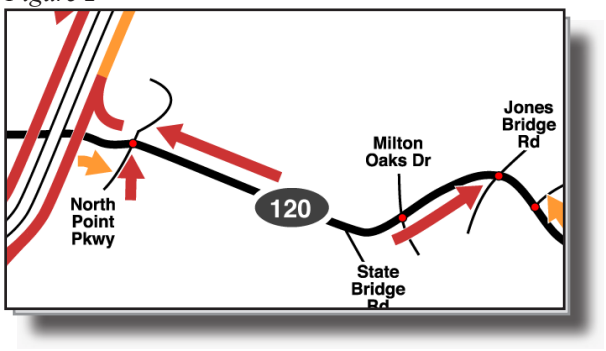
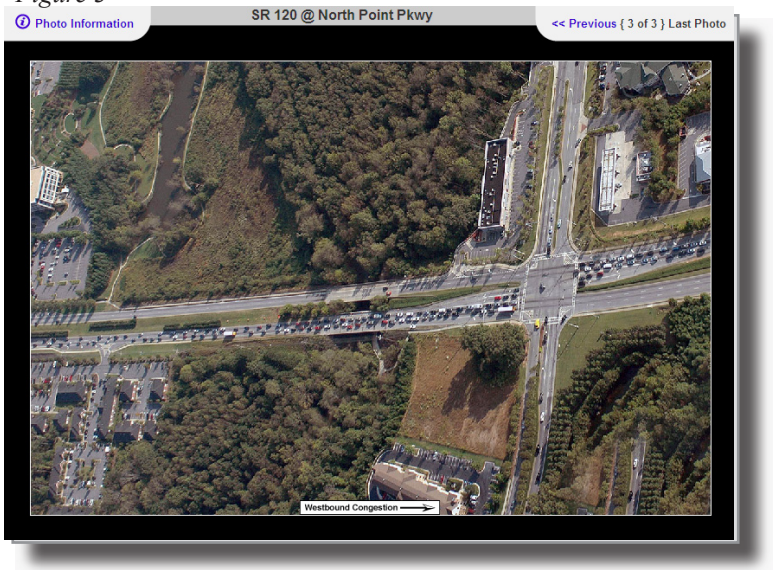


Figure 3: Highlight bottleneck photos like this one are accessed by "clicking" on arrows in the bottleneck maps. Note that the "Photo Information" button visible above the top-left corner of the photo provides information about the nature of the congestion.

Figure 3



Tool #2: Web-based Comparative Maps

Bottleneck maps discussed above depict the most recent survey findings, using red and orange arrows to represent congestion. However, in order to compare changes between the most recent two survey periods (in this case, 2001 and 2005), morning and evening bottleneck maps were modified to create corresponding "comparative maps". This conversion was done by stripping out the red and orange colors for all locations where congestion remained the same; red arrows were changed to black, and orange arrows were changed to gray. Red and orange colors were retained only where the later conditions reflect significantly degraded conditions compared to the earlier. Conversely, where mobility significantly improved (but technically remained congested), orange arrows outlined with green borders were used. Similarly, new green arrows were created to depict where previously-found congestion was no longer found. The end effect is that all the changes are highlighted in color, making it easier to comprehend where the most changes have been taking place.

Figure 4

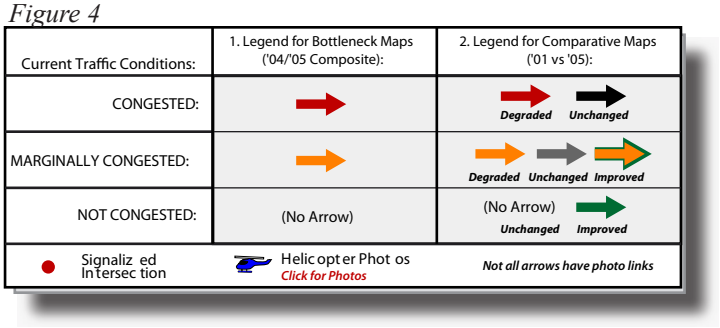


Figure 4: Legend showing how the colors of bottleneck arrows have been modified for the comparative maps, in order to show recent changes.

Figure 5a

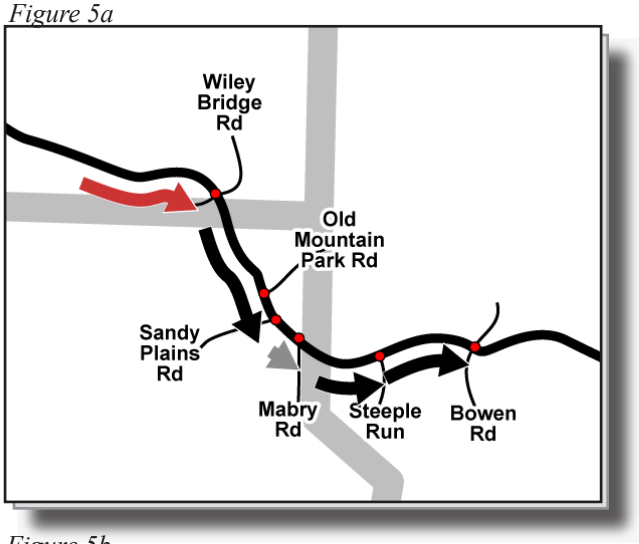
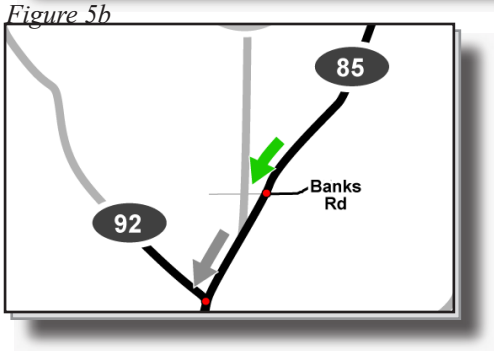


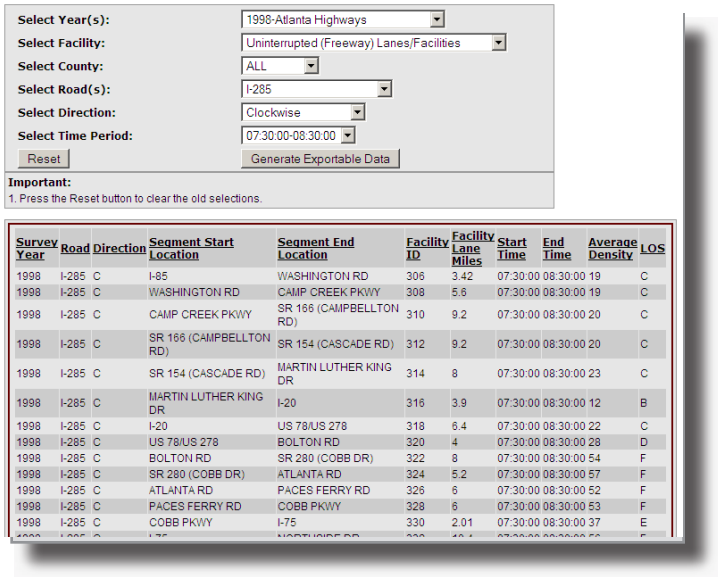
Figure 5b



Figures 5a (top) and 5b (bottom): Samples from a comparative map showing how congestion previously found (black and gray arrows) has now extended farther upstream (red arrow); and how congestion previously found no longer forms (green arrow).

Tool #3: Web-based Data Extraction and Report Generation

A. Exportable tables of performance ratings: The performance ratings that were produced by this survey program have been placed in a database for custom queries by website users. Filters can be chosen to isolate specific highways, counties or time periods. The resulting performance measures can then be exported to a spreadsheet format for custom analysis by the user.



Survey Year	Road	Direction	Segment Start Location	Segment End Location	Facility ID	Facility Lane Miles	Start Time	End Time	Average Density	LOS
1998	I-285	C	I-85	WASHINGTON RD	306	3.42	07:30:00	08:30:00	19	C
1998	I-285	C	WASHINGTON RD	CAMP CREEK PKWY	308	5.6	07:30:00	08:30:00	19	C
1998	I-285	C	CAMP CREEK PKWY	SR 166 (CAMPBELLTON RD)	310	9.2	07:30:00	08:30:00	20	C
1998	I-285	C	SR 166 (CAMPBELLTON RD)	SR 154 (CASCADE RD)	312	9.2	07:30:00	08:30:00	20	C
1998	I-285	C	SR 154 (CASCADE RD)	MARTIN LUTHER KING DR	314	8	07:30:00	08:30:00	23	C
1998	I-285	C	MARTIN LUTHER KING DR	I-20	316	3.9	07:30:00	08:30:00	12	B
1998	I-285	C	I-20	US 78/US 278	318	6.4	07:30:00	08:30:00	22	C
1998	I-285	C	US 78/US 278	BOLTON RD	320	4	07:30:00	08:30:00	28	D
1998	I-285	C	BOLTON RD	SR 280 (COBB DR)	322	8	07:30:00	08:30:00	54	F
1998	I-285	C	SR 280 (COBB DR)	ATLANTA RD	324	5.2	07:30:00	08:30:00	57	F
1998	I-285	C	ATLANTA RD	PACES FERRY RD	326	6	07:30:00	08:30:00	52	F
1998	I-285	C	PACES FERRY RD	COBB PKWY	328	6	07:30:00	08:30:00	53	F
1998	I-285	C	COBB PKWY	I-75	330	2.01	07:30:00	08:30:00	37	E

Figure 6: Query options and resulting table of segments and performance ratings, for export to database or spreadsheet formats for user analysis.

B. Comparative LOS Report:
The Comparative LOS Report permits users to generate colorful side-by-side level-of-service matrices for any surveyed highway that show, by segment, by direction and by survey hour, how mobility has been changing from year to year. In these displays, performance ratings are colored to signify mobility: green signifies favorable conditions for drivers (travel at uncongested speeds with room to maneuver freely); yellow for heavier traffic conditions; orange for minor congestion at reduced speeds, and red for severe, stop-and-go congestion. The visual impact of a matrix display that is mostly green contrasts sharply with a display that is mostly orange or red. At a glance it is easy to see where, when and in what direction mobility is most seriously impeded. Since surveys are repeated every few years, matrix displays from different years are placed side-by-side to reveal the presence or absence of trends.

1998			2001			2002			2004			2005			
16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	16:00 to 17:00	17:00 to 18:00	18:00 to 19:00	
C	D	E	F	F	C	-	-	-	-	-	-	E	D	B	RTE 400
F	F	F	F	F	C	-	-	-	-	-	-	F	F	C	ASHFORD-DUNWOODY RD
F	F	F	F	F	E	-	-	-	-	-	-	F	F	E	CHAMBLEE-DUNWOODY RD
F	F	F	F	F	D	-	-	-	-	-	-	F	F	F	PEACHTREE RD
F	F	F	E	F	F	-	-	-	-	-	-	F	F	F	SR 141 (PEACHTREE INDUS. BLVD)
F	F	F	F	F	F	-	-	-	-	-	-	F	F	F	SR 13
F	F	F	F	F	F	-	-	-	-	-	-	F	F	D	I-85
F	F	F	F	F	F	-	-	-	-	-	-	F	F	E	CHAMBLEE-TUCKER RD
F	F	E	F	F	F	-	-	-	-	-	-	F	F	E	LAVISTA RD
F	F	F	E	F	F	-	-	-	-	-	-	E	F	E	SR 8/US 29
E	E	E	E	F	D	-	-	-	-	-	-	E	E	E	US 78/US 29
E	E	D	D	E	D	-	-	-	-	-	-	F	E	D	PONCE DE LEON AVE
E	E	D	E	E	D	-	-	-	-	-	-	E	E	D	SR 10 (MEMORIAL DR)
D	D	D	D	D	D	-	-	-	-	-	-	D	E	C	SR 12 (COVINGTON HWY)
D	D	C	C	D	C	-	-	-	-	-	-	C	D	D	SR 260 (GLENWOOD RD)
															I-20

Figure 7: Evening comparative LOS report for I-285 (clockwise flow direction, 4:00 to 7:00 p.m.); this shows that I-285 was surveyed in 1998, 2001 and 2005. Direction of traffic flow is from top to bottom. Note the apparent improvement evident between 2001 and 2005 (circles); this graphic correlates to the improvement on I-285 between SR 8 and US 78 duscussed in Part One of this report.

C. LOS Bar Chart Report:
The LOS Bar Chart Report shows how much of a selected system or subsystem (metro-wide, county or specific highway) was operating at each LOS value during each surveyed year; this reveals, on a simplified macro level, the degree to which congestion levels have been changing or staying the same. This report computes, for a selected highway or group of highways, the total number of lane-mile-hours operating at each LOS value during a typical morning or evening commuter period. A bar chart is then produced, with lane-mile-hours as the 'Y-axis' parameter, and with a separate bar for each surveyed year along the X-axis. LOS data are 'stacked' onto each bar such that, if performance ratings indicate traffic flow degradation between surveyed years, less of the bar is colored green (for LOS values A, B or C), and a greater percentage of the bar is colored yellow, orange or red (for LOS values D, E or F, respectively). Once side-by-side bars have been generated, this report makes it easy to see if, given recent levels of investment, the selected subsystem or specific highway has been keeping pace with demand or falling behind. If the user elects to analyze the first or third hour of the morning or evening analysis periods, peak-hour spreading will be evident in these displays.

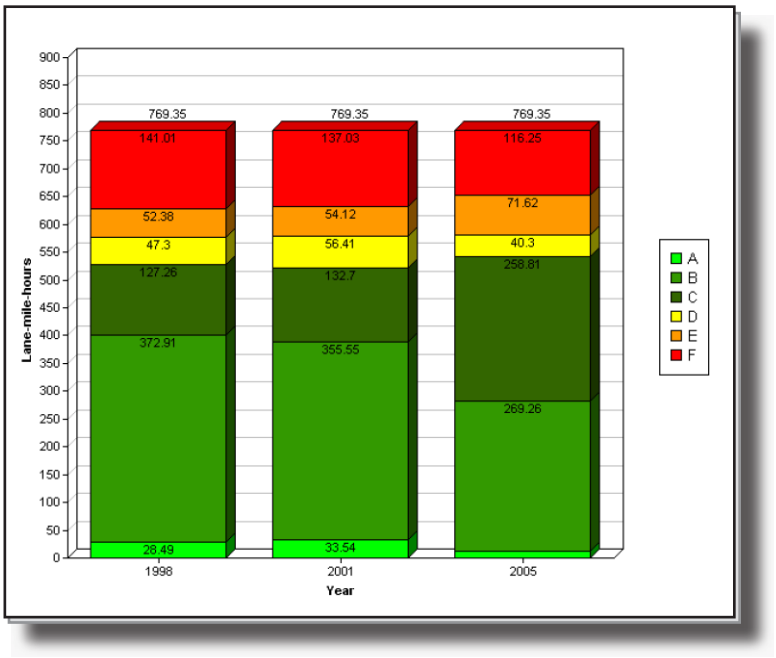


Figure 8: LOS bar chart report showing the number of lane-mile-hours operating at each LOS rating on the entirety of I-285 (clockwise direction; this correlates to the comparative LOS report sample shown in Figure 7 above). Note that while fewer lane-miles were operating at LOS A or B in 2005, indicating increased usage, the number of lane-miles operating at LOS F decreased significantly (red portion of the bars). This is the result of improved flow due to a mobility-improvement project for traffic exiting to Stone Mountain Freeway. Overall, this chart shows that overall mobility on I-285 has improved rather than degraded (due to the project) in this direction during the evening survey period.

Tool #4: PDF Reports and Maps for Download

The "Additional Resources" link on the website allows users to download PDF versions of all printed reports that have been delivered as part of this survey program, beginning with the 1998 survey findings. It also includes PDF copies of the current bottleneck and comparative maps. All of these reports feature detailed time/space level-of-service diagrams that show performance ratings by segment, direction and time slice for each survey year.